

## Dear users of Inspur server,

Sincerely thank you for using Inspur server.

This manual introduces the technical characteristics, system installation and setup of the server, and helps you to particularly understand and expediently use this server.

Please deliver the package of our product to the waste recycling station, in favor of pollution prevention and benefiting humankind.

This manual is the property of Inspur.


This User Manual is not to be copied by any group or person in any manner without the consent of Inspur. Inspur reserves the right of revising this manual momentarily.

The information in this manual is subject to change without notice.

Please contact Inspur, if you have any questions or advice about this manual.

Inspur

December, 2015

 is the registered trademark of Inspur. All the other trademarks or registered trademarks mentioned in this manual are the property of their respective holders.

# Copyright Introduction

Document Version: V1.0

Release Date: 5<sup>th</sup> December, 2015

Document Introduction: 1st formal issuance

## Abstract

The manual introduces issues closely related to maintenance such as specifications, hardware operation, software configuration, service terms, fault diagnosis etc. of the server.

Readers of this guide will be deemed to have abundant knowledge about the server product and have received adequate technical training, and will not cause any personal injury or product damage during operation and maintenance.

## Target Audience

This manual mainly applies to the following personnel:

- Technical support engineers
- Product maintenance engineers


It is suggested that server maintenance operation shall be carried out by professional engineers with related server knowledge via referring to this manual.

# Table of Contents

1 Safety Instructions .....	1
2 Product Overview .....	6
2.1 Technical Specifications.....	6
2.2 NX5460M4 Views .....	6
2.3 Usage of NX5460M4 Blade Server .....	7
2.4 CLR_CMOS Jumper Introduction .....	8
3 BIOS Setup .....	9
3.1 System BIOS Setup Methods .....	9
3.2 BIOS Settings .....	10
3.3 Firmware Update .....	41
4 RAID System .....	43
4.1 How to Enter RAID Configuration Interface.....	43
4.2 Control Keys.....	44
4.3 SAS RAID Settings .....	44
4.4 SATA RAID Settings .....	47
5 Hardware Maintenance .....	50
5.1 Tool Preparation.....	50
5.2 Parts Replacement.....	50
6 Common Faults, Diagnosis and Troubleshooting.....	53
6.1 Common Faults.....	53
6.2 Diagnosis and Troubleshooting Instructions.....	54
7 Services .....	57
7.1 How to Obtain Warranty Service .....	57
7.2 How to Contact Inspur.....	57
8 Certifications & Standards .....	59
8.1 USA FCC Declaration .....	59
8.2 CE Declaration of EU.....	59
8.3 China Environmental Labeling.....	59

# 1 Safety Instructions

---

 **Warning:** the following warnings indicate that there are potential dangers that may cause property loss, personal injury or death:


---

1. The power supplies in the system may produce high voltages and energy hazards that may cause personal injury. Please do not demount the cover of the host to remove or replace any component in the system by yourself, unless otherwise informed by Inspur; only service technicians trained by Inspur have the right to demount the cover of the host, remove and replace the internal components.
2. Please connect the equipment to appropriate power supply, and only the type of external power supply indicated on the electrical ratings label can be used. To protect your equipment from damages caused by momentary spike or plunge of the voltage, please use relevant voltage stabilizing equipment or uninterruptible power supply.
3. If you must use an extension cable, use a three-core cable with properly grounded plugs. Observe extension cable ratings. Ensure that the total rating of all equipment plugged into the extension cable does not exceed 80 percent of the ratings limit for the extension cable.
4. Please be sure to use the power supply components that come with the server, such as power lines, power socket (if provided with the server) etc. For the safety of equipment and users, do not replace power cables or plugs randomly.
5. To prevent electric shock dangers caused by leakage in the system, please make sure that the power cables of the system and peripheral equipment are correctly connected to the earthed power socket. Please connect the three-core power line plug to the three-core AC power socket that is well earthed and easy to access, be sure to use the earthing pin of power lines and do not use the patch plug or the earthing pin unplugged with cables. In case of the earthing conductors not installed and it is uncertain whether there are appropriate earthing protections, please do not operate or use the equipment. Contact and consult with the electrician.
6. Please do not push any objects into the openings of the system. Doing so may cause fire or electric shock because of internal components short circuit.
7. Please place the system far away from the cooling plate and the place with heat sources,

and be sure not to block the air vents.

8. Be sure not to scatter food or liquid in the system or on other components, and do not use the product in humid and dusty environment.
9. Using an incompatible battery may cause explosion. When battery replacement is required, please consult the manufacturer first, and choose batteries of the same or equivalent type. Do not disassemble, crush, puncture the batteries or make the external connection point short circuit, and do not expose them in the environment over 60°C. Never throw them into fire or water. Please do not attempt to open or repair the batteries, and be sure to reasonably deal with the exhausted batteries and do not put the exhausted batteries, the circuit boards that may include batteries and other components together with other wastes. For relevant battery recycling, please contact the local waste recycling center.
10. Before installing equipment into the rack, please install all front and side stabilizers on the independent rack first; for the rack connecting with other racks, it shall install the front stabilizers first. If you fail to install the corresponding stabilizers before installing equipment into the rack, it may cause the cabinet to tip over in some cases, and thus may cause personal injury. Therefore, it is necessary to install stabilizers before installing equipment into the rack. After installing the equipment and other components into the rack, it can only pull out one component from the rack through its sliding part at one time. Pulling out several components at the same time may lead the rack to turn over and cause serious personal injury.
11. Please do not move the rack by oneself. Considering the height and weight of the rack, at least two people are needed to complete its movement.
12. Please do not directly touch the copper busbar when the rack is powered on, and it is prohibited to directly short-circuit the copper busbar.
13. This is Grade A product, and in the living environment, it may cause radio interference. In such case, users may need to take measures to deal with the interference.

---

 **Note:** The following considerations can help avoid the occurrence of problems that may damage the components or cause data loss, etc.

---

1. In case of the following cases, please unplug the power line plug from the power socket and contact customer service department of Inspur:

- 1) The power cables, extension cables or power plugs are damaged.
  - 2) The products get wet.
  - 3) The products have fallen off or been damaged.
  - 4) Objects fall into the products.
  - 5) When operating according to the operating instructions, the products cannot function normally.
2. If the system is affected with damp, please dispose according to the following steps:
    - 1) Power off the equipment, disconnect them with the power socket, wait for 10 to 20 seconds, and then open the host cover.
    - 2) Move the equipment to a well-ventilated place to dry the system at least for 24 hours and make sure that the system is fully dried.
    - 3) Close the host cover, reconnect the system to the power socket, and then power on.
    - 4) In case of operation failure or abnormal situation, please contact Inspur and get technical support.
  3. Pay attention to the position of system cables and power cables, wire them in places not to be stepped on or knocked down and ensure not to place other objectives on the cables.
  4. Before removing the host cover or touching the internal components, you shall cool down the equipment first; to avoid damaging the mainboard, please power off the system and wait 5 seconds, and then remove the components from the mainboard or disconnect a peripheral device from the system.
  5. If there are modem, telecom or LAN options installed in the equipment, please pay attention to the following matters:
    - 1) In case of thunder and lightning weather, please do not connect or use the modem. Otherwise, it may suffer from lightning stroke.
    - 2) Never connect or use the modem in damp environment.
    - 3) Never insert the modem or telephone cables into the socket of network interface controller (NIC).
    - 4) Before unpacking the product package, touching or installing internal components or touching uninsulated cables or jacks of the modem, please disconnect the modem cables.
  6. In order to prevent the electrostatic discharge from damaging the electronic components in the equipment, please pay attention to the following matters:

- 1) You shall conduct off the static electricity on the body before dismounting or touching any electronic component in the equipment. You can conduct off the static electricity on the body by touching the metal earthing objects (such as the unpainted metal surface on the rack) to prevent the static electricity on the body from conducting itself to the sensitive components.
  - 2) For electrostatic sensitive components not ready to be installed for application, please do not take them out from the antistatic package materials.
  - 3) During the work, please touch the earthing conductor or the unpainted metal surface on the cabinet regularly to conduct off the static electricity on the body that may damage the internal components.
7. When dismounting the internal components with the approval of Inspur, please pay attention to the following matters:
- 1) Switch off the system power supply and disconnect the cables, including all connections of the system. When disconnecting the cables, please hold the connector of cables and plug it out, and never pull the cables.
  - 2) Before dismounting the host cover or touching the internal components, the products need to be cooled down.
  - 3) Before dismounting or touching any electronic component in the equipment, you shall conduct off the static electricity on the body by touching the metal earthing objectives.
  - 4) During the dismounting process, the movement range shall not be too big, so as to prevent damage to the components or scratching arms.
  - 5) Carefully deal with the components and plug-in cards, and please never touch the components or connection points on the plug-in cards. When taking the plug-in cards or components, you should grab the edges of the plug-in cards or components or their metal fixed supports.
8. During the process of rack installation and application, please pay attention to the following matters:
- 1) After the rack installation is finished, please ensure that the stabilizers have been fixed to the rack and supported to the ground, and all weight of the rack have been fell onto the ground.
  - 2) Always load from the bottom up, and load the heaviest items first.
  - 3) When pulling out the components from the rack, it shall apply force slightly to keep

the rack balanced.

- 4) When pressing down the release latch of the sliding rail of components and sliding in or out, please be careful, as the sliding rail may hurt your fingers.
- 5) Do not overload the AC power supply branch circuits in the rack. The total load of the rack shall not exceed 80% of the ratings of branch circuits.
- 6) Ensure that components in the rack have good ventilation conditions.
- 7) When repairing components in the rack, never step on any other components.



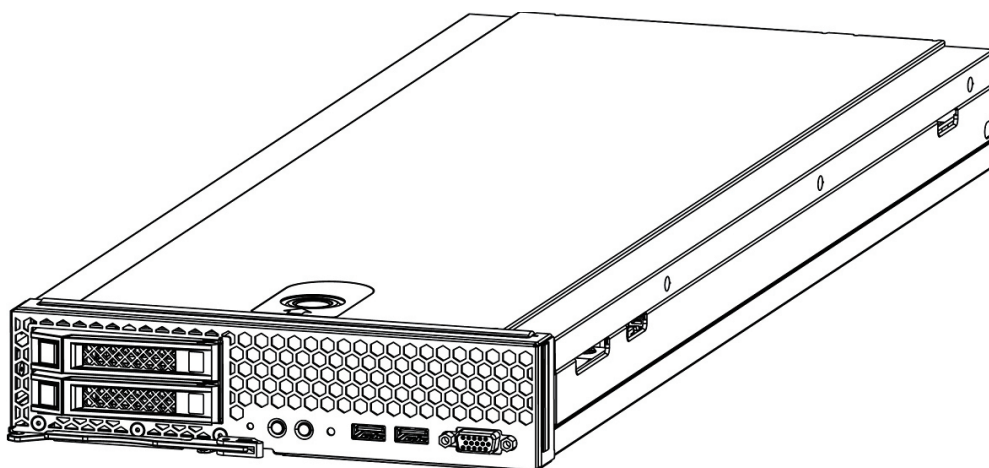
## 2 Product Overview

### 2.1 Technical Specifications

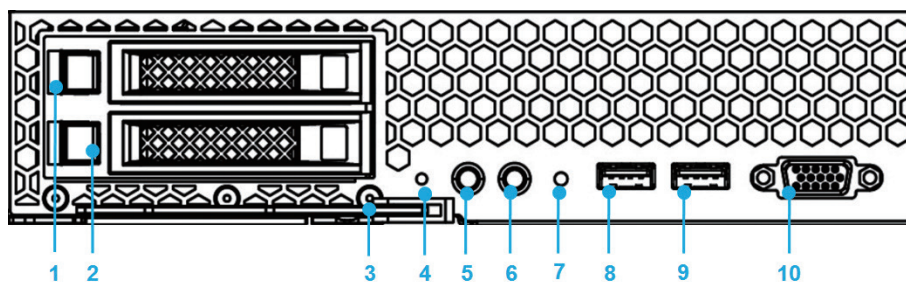
<b>Processor</b>	
Processor type	1 ~ 2 Intel® Xeon Haswell-EP series processors
Platform type	Grantley-EP 2S Platform
<b>Memory</b>	
Memory type	DDR4-1600/1866/2133 ECC Registered Support RDIMM & LRDIMM
DIMM slot Qty.	24
Total capacity	Support up to 1.5TB
<b>Display controller</b>	
Controller type	Integrated graphics
<b>Network</b>	
Controller type	Integrated dual gigabit Ethernet controller
<b>HDD controller</b>	
SATA controller	Support 2 2.5-inch hot-plug SAS/ SATA / SSD HDDs
RAID	<ul style="list-style-type: none"> <li>• Onboard RAID controller: support RAID0 , RAID1</li> <li>• SAS RAID Mezz: support RAID0 , RAID1 , RAID5</li> </ul>

### 2.2 NX5460M4 Views

#### General view



Front view



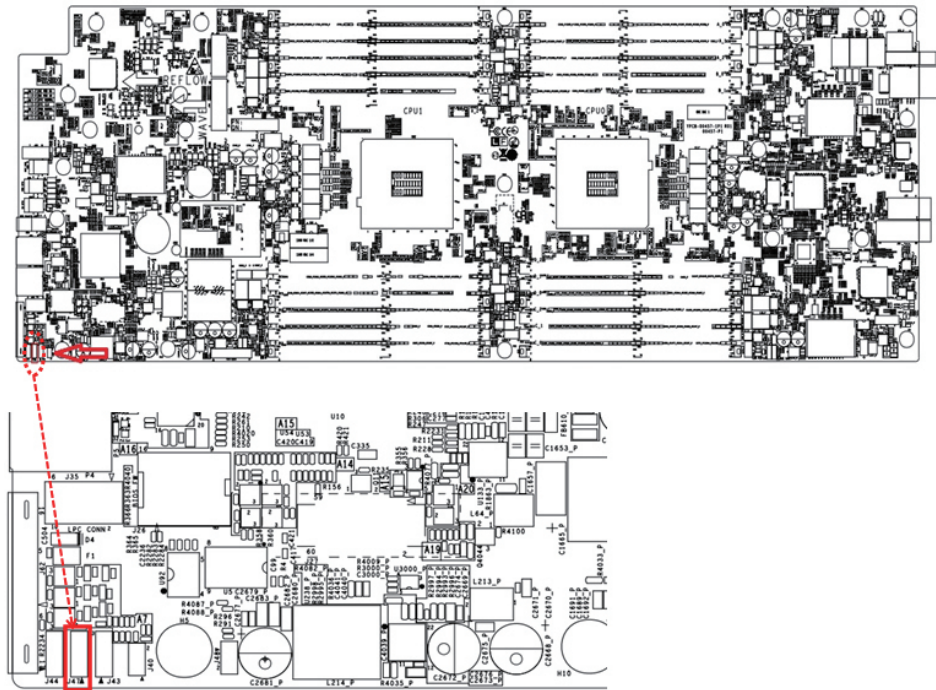
No.	Name & Function
1 ~ 2	HDD1/HDD0
3	Handle
4	Reset button
5	Power button/indicator Off: the compute node is not powered on; Steady green: the compute node is powered on normally; Blinking yellow: the power of computer node is in lock state for the moment, or there is a power problem, it fails to power on.
6	UID button/indicator: Used to locate the compute node in the rack; ON/OFF: controlled through SMC remotely or manual operation. Off: BMC initialization is complete or the compute node is not located; Blinking blue: BMC initializing. The compute node's BMC detects it has been inserted and is building communication with SMC; Steady blue: the compute node is located.
7	Status indicator Off: the compute node is normal; Blinking yellow: there is a critical alarm.
8 ~ 9	USB3.0 port
10	VGA

## 2.3 Usage of NX5460M4 Blade Server

NX5460M4 blade server must be used together with Inspur I9000 server; it can be used only after being installed in I9000 server system. About how to install NX5460M4 into I9000 server, please refer to the relevant section in I9000 server user manual or the installation diagram on the host chassis of I9000 blade server, it will not be repeated here.

## 2.4 CLR\_CMOS Jumper Introduction

The jumper position is shown in the following figure:



Jumper No.	Name	Jumper Functions
CLR_CMOS	CMOS clear jumper	Short-circuit pin1-2, to restore normal status; short-circuit pin2-3, to clear CMOS.

### Note:

It is required to shut down the system, as well as disconnect power supply during CMOS clearing, and hold for 5 seconds after short-circuiting Pin2-3; then short-circuit Pin1 and Pin2 of CLR\_CMOS jumper (the default status) with a jumper cap, to restore to its original status.

## 3 BIOS Setup

This chapter introduces how to configure BIOS. All operations described in this section are only limited to operators or administrators with system maintenance qualification.

BIOS is a basic input and output system. The system parameters and hardware parameters can be adjusted through special setup procedure. BIOS has a great impact on the system booting and running, setting parameters improperly may cause conflicts among hardware resources, or degrade the system running performance. Hence understanding the BIOS setup is significant to the configuration of your server. If no especial requirement, you are suggested to use the default value and not alter the parameters arbitrarily.

### Note:

1. Before changing the BIOS setup, please record the corresponding original setup. Hence when there are operating problems in the system due to the option altered, the setup can revert to the previous state.
2. Ordinarily the factory default settings are the optimal settings. Don't try to alter the parameters before you understand their denotations.
3. The common settings are introduced in detail in this chapter. The less referred options during using are simply explained or not.
4. The BIOS content varies according to different configurations of the products; hence the detailed introduction is elided.

### 3.1 System BIOS Setup Methods

Power on the server, system starts to boot, when Inspur logo appears on the screen, press [ESC] button; when “Entering Setup...” appears in the lower right corner, it will enter system BIOS configuration later, and you could select options in BIOS main menu using arrow buttons to enter sub-menu.



**Note:** Options in grey are not available. Options with symbol “▶” have a sub-menu.  
Control key instruction table

Key	Function
<Esc>	Exit or return from sub-menu to main menu.
<←> or <→>	Select a menu.
<↑> or <↓>	Move the cursor up or down.
<Home> or <End>	Move the cursor to the top or bottom of the screen
<+> or <->	Select the previous or next value or setting of the current one.
<F1>	Help
<F2>	Restore to the last configuration.
<F9>	Restore to default configuration.
<F10>	Save and exit
<Enter>	Execute commands or select a sub-menu.

## 3.2 BIOS Settings

### 3.2.1 Main Menu

Main interface includes BIOS information, memory information, system date, etc. As shown below:

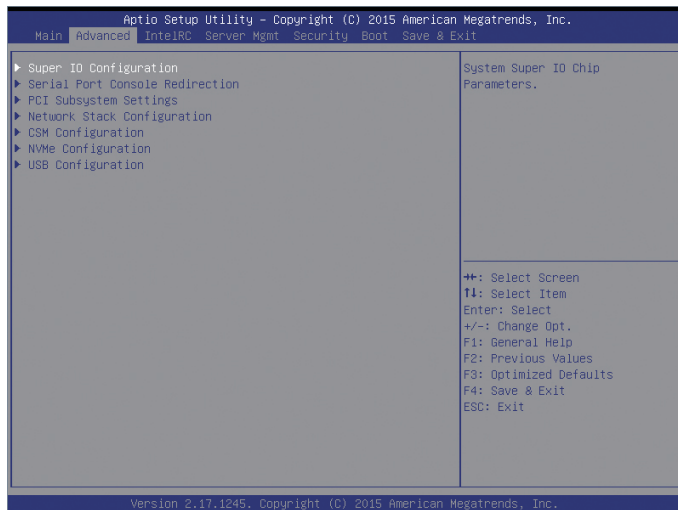


Parameter description of Main interface:

Parameters	Function description
BIOS Information	Display BIOS Vender, Core version, BIOS version, build date and time
Memory Information	Display the current total memory
System Date (Day mm/dd/yyyy)	Display and set system date and time
System Time (hh/mm/ss)	Use <Tab> key to switch between items, you can directly enter the value or use +/- key to change
Access Level	Current access level

### 3.2.2 Advanced Menu

Advanced interface includes BIOS system parameters and the related function control, such as serial port, PCI subsystem, CSM, NVMe, USB, onboard NIC, etc; as shown below.

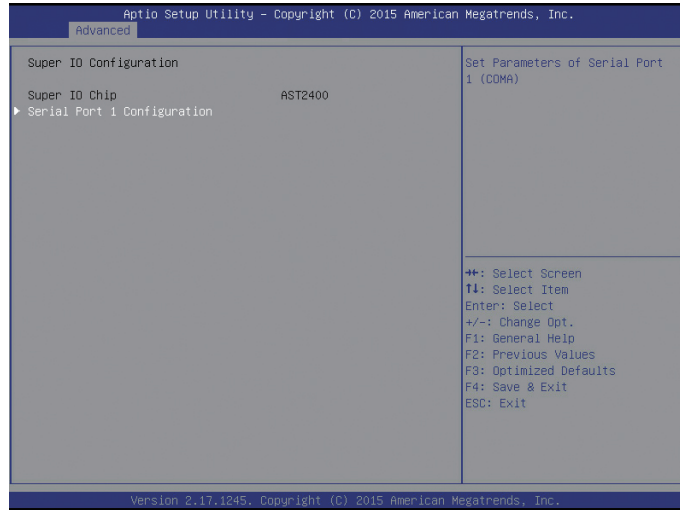


Parameter description of Advanced interface:

Parameters	Function description
Super IO Configuration	AST2400 I/O chip parameter configuration
Serial Port Console Redirection	Serial port console redirection settings
PCI Subsystem Settings	PCI subsystem settings
Network Stack Configuration	Network stack configuration
CSM Configuration	CSM configuration
NVMe Configuration	NVMe configuration
USB Configuration	USB configuration

#### 3.2.2.1 Super IO Configuration

Super IO Configuration interface is used to set the options related with I/O chip, as shown below:

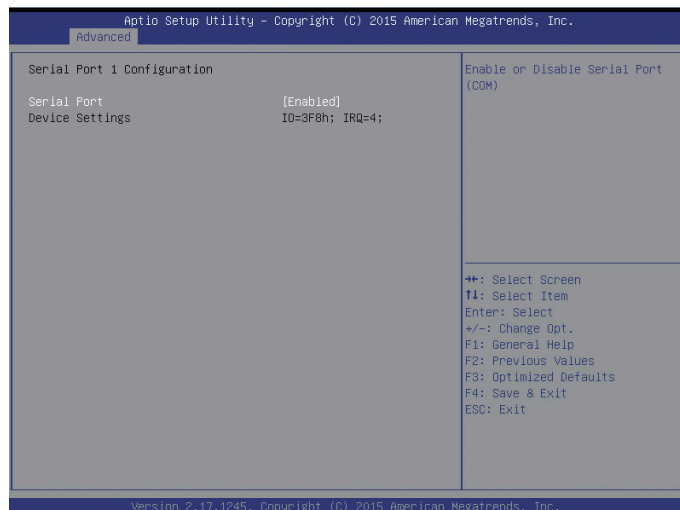


Parameter description of AST2400 Super IO Configuration interface:

Parameters	Function description
Super IO Chip	Display the super I/O chip used by the motherboard currently
Serial Port1 Configuration	Serial port1 configuration

### Serial Port1 Configuration

Serial Port1 Configuration interface is used to set the options related with I/O chip, as shown below:

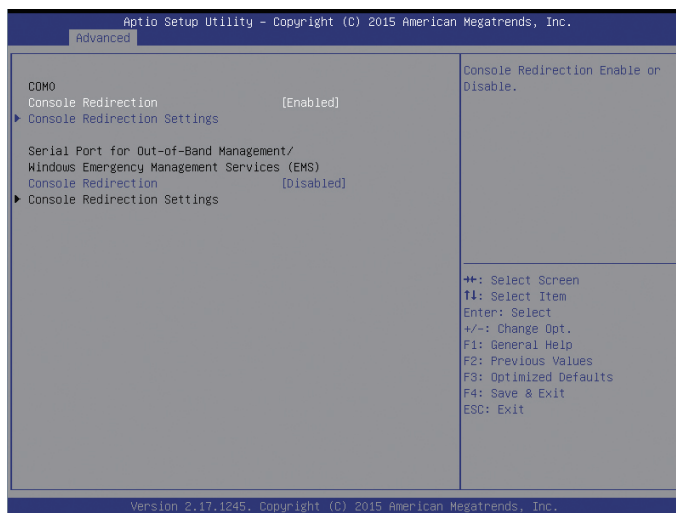


Parameter description of Serial Port1 Configuration interface:

Parameters	Function description
Serial Port	On-off control of serial port1
Device Settings	IO resources used by serial port1

### 3.2.2.2 Serial Port Console Redirection

Serial Port Console Redirection interface is used to set the options related with serial port console redirection, as shown below:

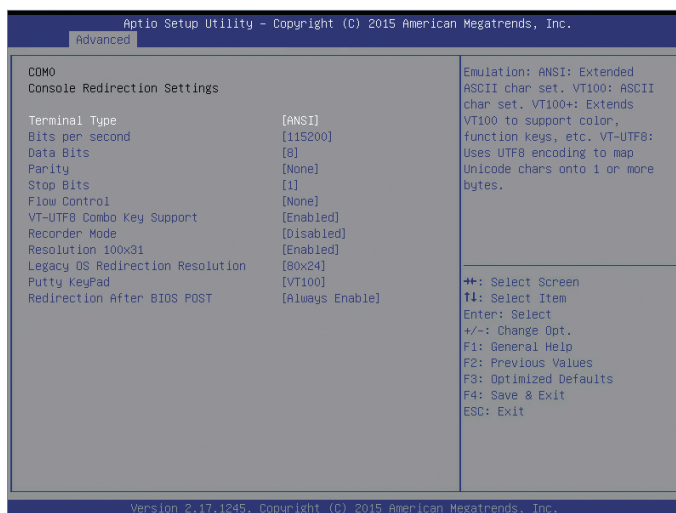


Parameter description of Serial Port Console Redirection interface:

Parameters	Function description
Console Redirection	On-off setting of console redirection
Console Redirection Settings	Parameter settings of console redirection
Console Redirection(EMS)	On-off setting of console redirection (EMS)
Console Redirection Settings(EMS)	Parameter settings of console redirection (EMS)

#### Console Redirection Settings

If the option of Console Redirection is set to **【Enabled】**, Console Redirection Settings menu will be opened, as shown below:



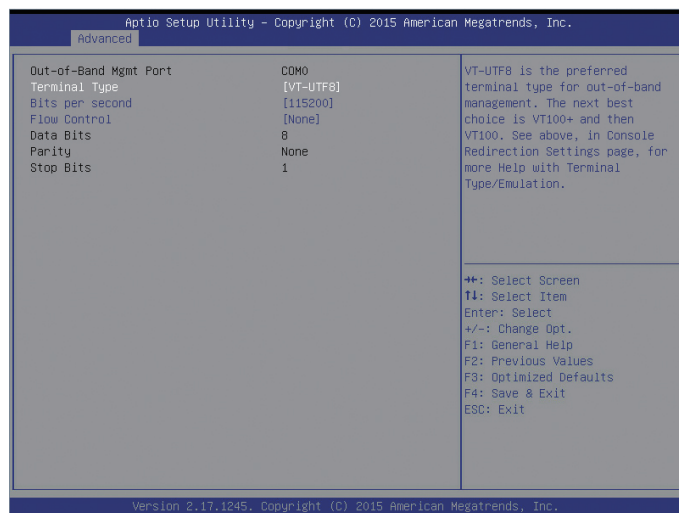


Parameter description of Console Redirection Settings interface:

Parameters	Function description
Terminal Type	Terminal type setting
Bits per second	Bits per second setting
Data Bits	Data bits setting
Parity	Parity setting
Stop Bits	Stop bits setting
Flow Control	Flow control setting
VT-UTF8 Combo Key Support	VT-UTF88 combo key support setting
Recorder Mode	Recorder mode setting
Resolution 100×31	Terminal resolution setting
Legacy OS Redirection Resolution	Legacy OS redirection resolution setting
Putty KeyPad	Putty keypad setting
Redirection After BIOS POST	Redirection setting after BIOS POST

### Console Redirection Settings (EMS)

If the option of Console Redirection (EMS) is set to **【Enabled】**, Console Redirection Settings menu will be opened, as shown below:

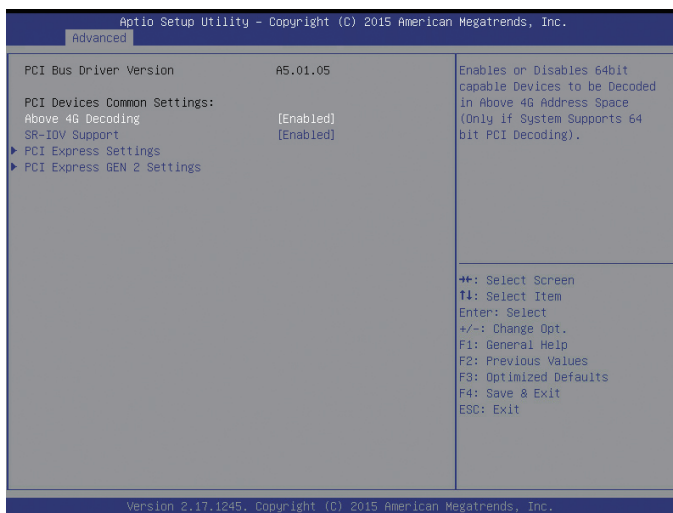


Parameter description of Console Redirection Settings interface:

Parameters	Function description
Terminal Type	Terminal type setting
Bits per second	Bits per second setting
Flow Control	Flow control setting
Data Bits	Data bits setting
Parity	Parity setting
Stop Bits	Stop bits setting

### 3.2.2.3 PCI Subsystem Settings

PCI Subsystem Settings interface is used to set the options related with PCI subsystem, as shown below:

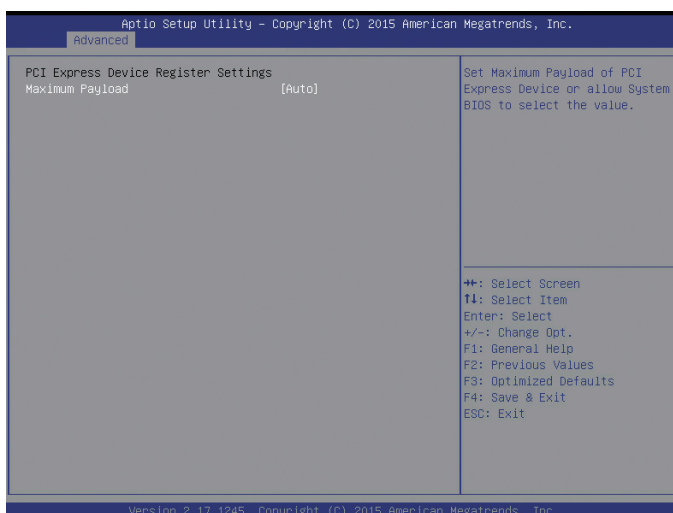


Parameter description of PCI Subsystem Settings interface:

Parameters	Function description
Above 4G Decoding	Above 4G memory access control switch, enable or disable above 4G decoding function
SR-IOV Support	On-off setting of SR-IOV support
PCI Express Settings	PCI express settings
PCI Express GEN 2 Settings	PCIe Gen2 settings

### PCI Express Settings

PCI Express Settings interface is used to set the options related with PCIe subsystem, as shown below:

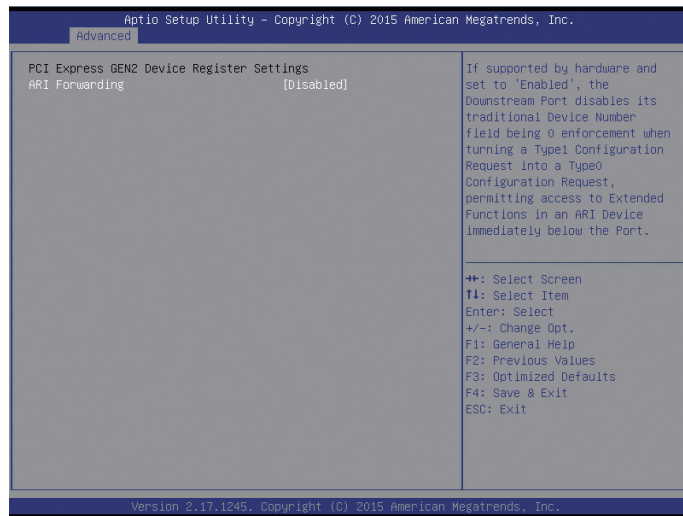


Parameter description of PCI Express Settings interface:

Parameters	Function description
Maximum Payload	Maximum Payload setting of PCIe devices

### PCI Express GEN 2 Settings

PCI Express GEN 2 Settings interface is used to set the options related with PCIe subsystem, as shown below:

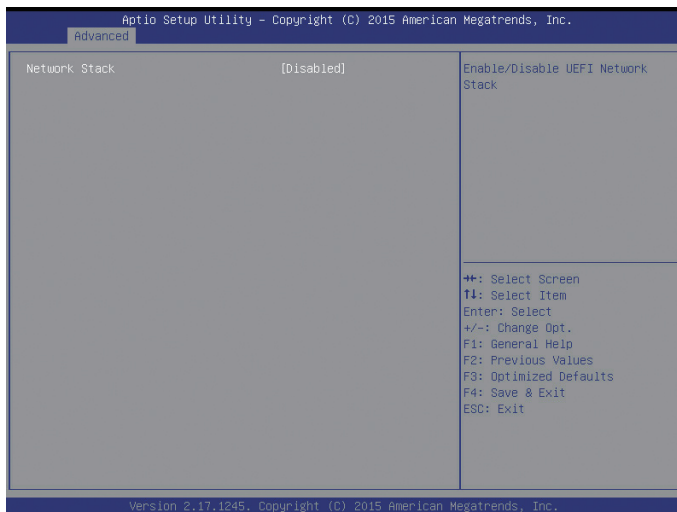


Parameter description of PCI Express GEN 2Settings interface:

Parameters	Function description
ARI Forwarding	On-off setting of ARI forwarding function. If enabled, there is only one device in one bus, the device ID will be ignored, so that one device can have 256 functions.

### 3.2.2.4 Network Stack Configuration

Network Stack Configuration interface is used to set the options related with network module, as shown below:

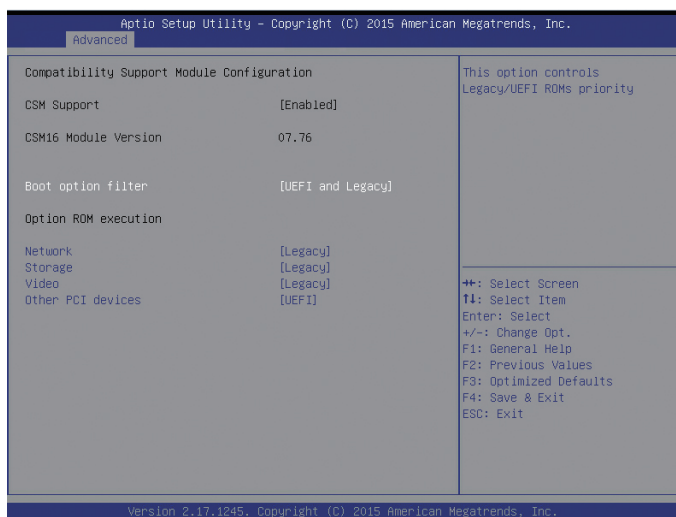


Parameter description of Network Stack interface:

Parameters	Function description
Network Stack	On-off setting of network stack function

### 3.2.2.5 CSM Configuration

CSM Configuration interface is used to set the options related with compatibility support module, as shown below:



Parameter description of CSM Configuration interface:

Parameters	Function description
CSM Support	Support compatible mode
Boot option filter	Boot option filter setting, control the boot policy of Legacy and UEFI Option Rom; the option parameters have UEFI and Legacy/UEFI only/Legacy only.
Option ROM execution	Option ROM execution mode
Network	Set NIC option ROM execution mode, option parameters: Legacy/UEFI
Storage	Set storage devices option ROM execution mode, option parameters: Legacy/UEFI
Video	Set video devices option ROM execution mode, option parameters: Legacy/UEFI
Other PCI devices	Set other PCI devices option ROM execution mode, option parameters: Legacy/UEFI

### 3.2.2.6 NVMe Configuration

NVMe Configuration interface is used to set the options related with NVMe devices.

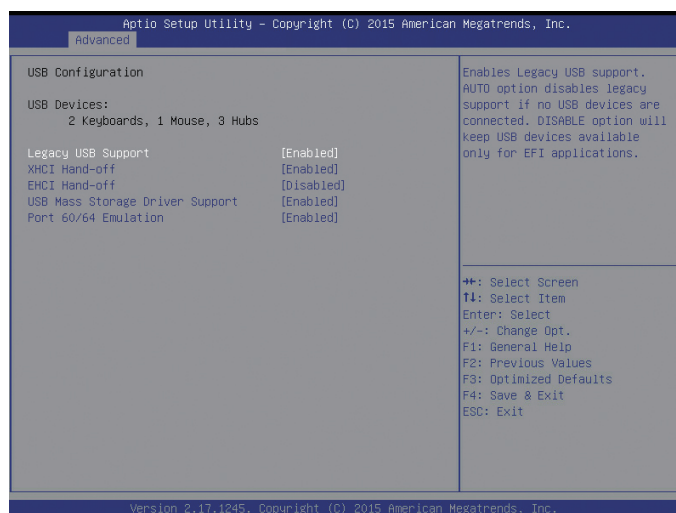


Parameter description of NVMe Configuration interface:

Parameters	Function description
NVMe controller and Drive information	NVMe information display

### 3.2.2.7 USB Configuration

USB Configuration interface is used to set the options related with USB.

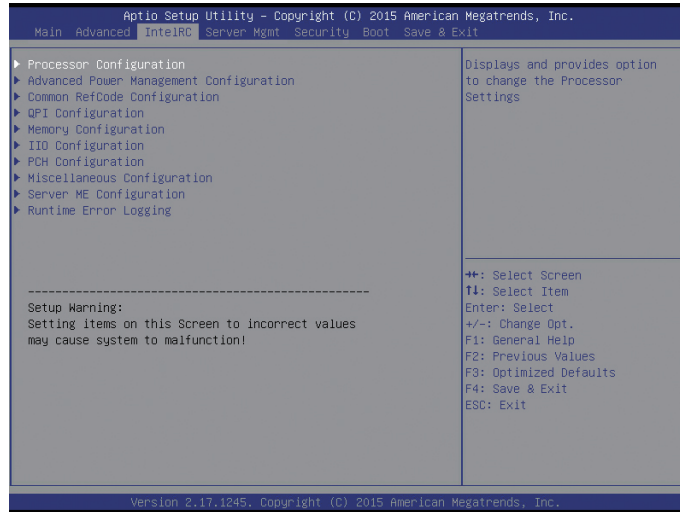


Parameter description of USB interface:

Parameters	Function description
USB Devices	Current USB device information
Legacy USB Support	On-off setting of legacy USB support
XHCI Hand-off	Enable or disable the XHCI hand-off function. For the OS that does not support XHCI (USB3.0) function, enabling XHCI hand-off function can realize the support for XHCI.
EHCI Hand-off	Enable or disable the EHCI hand-off function. For the OS that does not support EHCI (USB2.0) function, enabling EHCI hand-off function can realize the support for EHCI.
USB Mass Storage Driver Support	On-off setting of USB mass storage driver support
Port 60/64 Emulation	On-off setting of USB port 60/64 emulation

### 3.2.3 Intel RC

Chipset interface includes the information of CPU, QPI, memory, PCH, ME and other devices; the management of these devices can be realized through this interface.

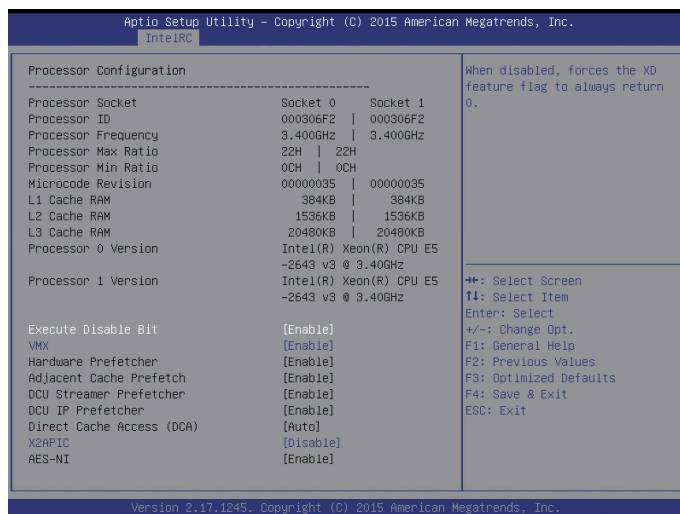


Parameter description of Intel RC interface:

Parameters	Function description
Processor Configuration	Processor configuration
Advanced Power Management Configuration	Advanced power management configuration
Common Configuration	Common configuration
QPI Configuration	QPI configuration
Memory Configuration	Memory configuration
IIO Configuration	IIO configuration
PCH Configuration	PCH configuration
Miscellaneous Configuration	Miscellaneous configuration
Server ME Configuration	Server ME configuration
Runtime Error Logging	Runtime error logging configuration

### 3.2.3.1 Processor Configuration

Processor Configuration interface is used to set the options related with processors.



Parameter description of Processor Configuration interface:

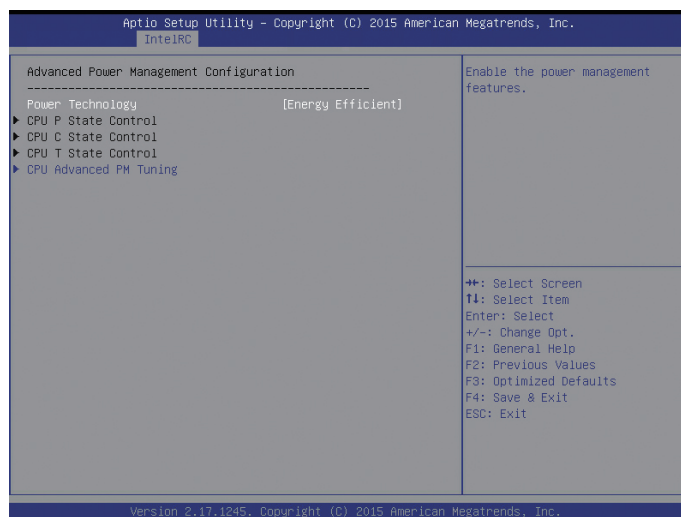
Parameters	Function description
Processor Information	Processor information submenu, display processor's detailed information
Processor Socket	Processor socket number
Processor ID	Processor ID
Processor Frequency	Processor frequency
Processor Max Ratio	Processor max ratio
Processor Min Ratio	Processor min ratio
Microcode Revision	Microcode version number, display CPU microcode version information
L1 Cache RAM	L1 cache RAM capacity
L2 Cache RAM	L2 cache RAM capacity
L3 Cache RAM	L3 cache RAM capacity
Processor 0 Version	Processor 0 version information
Processor 1 Version	Processor 1 version information
Execute Disable Bit	On-off setting of Execute Disable Bit
VMX	On-off setting of Intel Virtual Machine eXtensions technology
Hardware Prefetcher	On-off setting of hardware prefetcher Before CPU processing instructions or data, it will prefetch these instructions or data from memory to L2 cache, to shorten the amount of time reading memory takes, to help eliminate potential bottlenecks, to improve system performance.



Adjacent Cache Prefetch	<p>On-off setting of adjacent cache prefetch</p> <p>If this function is enabled, when computer reading data, it will intelligently consider the adjacent data is needed as well, and it will prefetch these data during processing, to speed up the reading process.</p>
DCU Streamer Prefetcher	<p>On-off setting of DCU streamer prefetcher</p> <p>This function can prefetch CPU data to shorten the data reading time.</p>
DCU IP Prefetcher	<p>On-off setting of DCU IP prefetcher</p> <p>This function can judge whether there is data to prefetch, to shorten the data reading time.</p>
Direct Cache Access (DCA)	<p>On-off setting of direct cache access (DCA)</p>
X2APIC	<p>On-off setting of X2APIC instruction</p> <p>If there are more than 255 threads, it must be enabled.</p>
AES-NI	<p>On-off setting of AES instruction</p> <p>This menu mainly control whether CPU supports AES instruction. These instructions are mainly used for system virtualization, enable this instruction, system performance will be improved.</p>

### 3.2.3.2 Advanced Power Management Configuration

Advanced Power Management Configuration is used to set the options related with CPU power management.

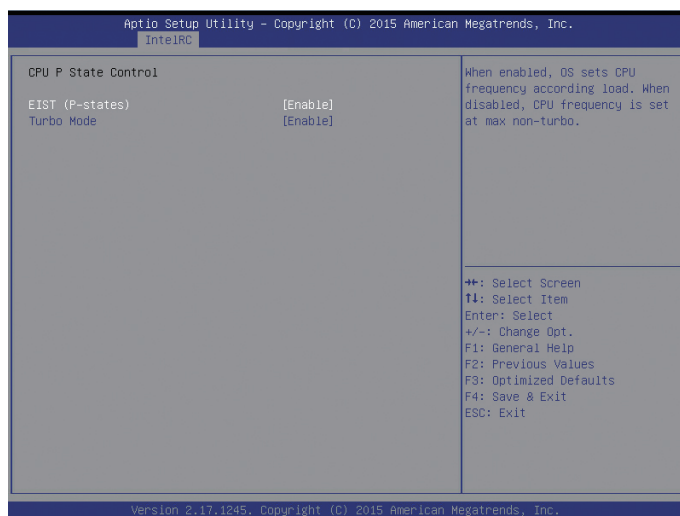


Parameter description of Advanced Power Management Configuration interface:

Parameters	Function description
Power Technology	Power management policy setting, option parameters: Energy Efficient/Disabled/Custom
CPU P State Control	CPU P state control submenu
CPU C State Control	CPU C state control submenu
CPU T State Control	CPU T state control submenu
CPU Advanced PM Tuning	CPU performance and energy saving tuning submenu

### CPU P State Control

CPU P State Control interface is used to set the options related with CPU P state; it will be enabled when Power Technology is set to **【Custom】** , controlling EIST on-off and Turbo mode.



Parameter description of CPU P State Control interface:

Parameters	Function description
EIST(P-states)	On-off setting of Enhanced Intel Speedstep Technology
Turbo Mode	On-off setting of dynamic Turbo mode

### CPU C State Control

CPU C State Control interface is used to set the options related with CPU C state; it will be enabled when Power Technology is set to **【Custom】** , controlling the power consumption when CPU is in idle state.

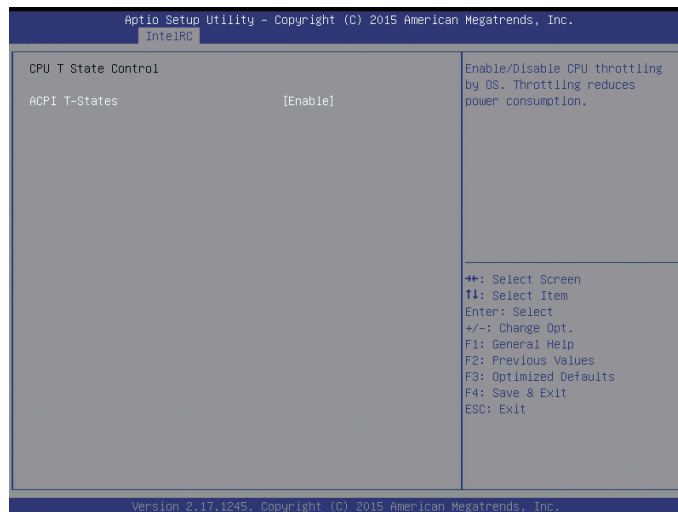


Parameter description of CPU C State Control interface:

Parameters	Function description
Package C State limit	C state limit setting
CPU C3 report	On-off setting of CPU C3 report
CPU C6 report	On-off setting of CPU C6 report
Enhanced Halt State (C1E)	On-off setting of C1E

### CPU T State Control

CPU T State Control interface is used to set the options related with CPU T state; it will be enabled when Power Technology is set to **【Custom】**, adjust CPU clock through OS to reduce the CPU power consumption.

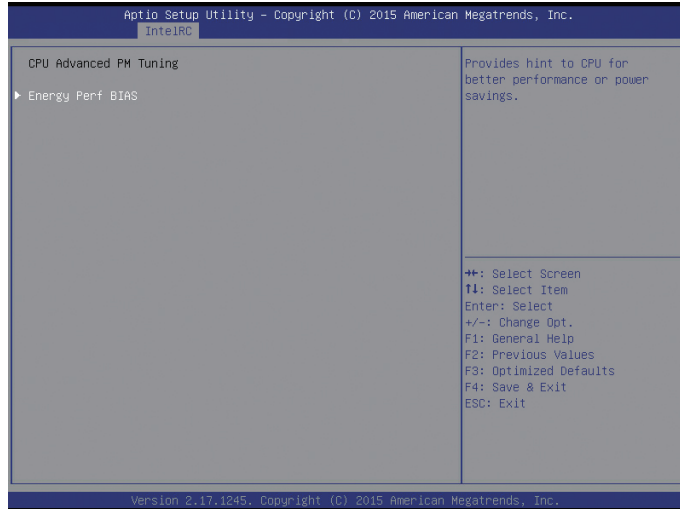


Parameter description of CPU T State Control interface:

Parameters	Function description
ACPI T-States	On-off setting of CPU T state

### CPU Advanced PM Tuning

CPU Advanced PM Tuning interface is used to set the options related with CPU performance and energy saving tuning.

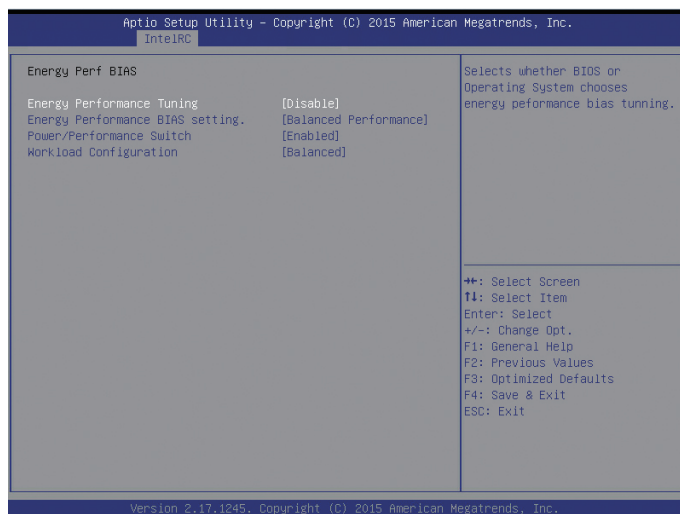


#### Parameter description of CPU Advanced PM Tuning interface

Parameters	Function description
Energy Perf BIAS	CPU performance and energy saving tuning submenu

### Energy Perf BIAS

Energy Perf BIAS interface is used to set the options related with CPU performance and energy saving tuning.

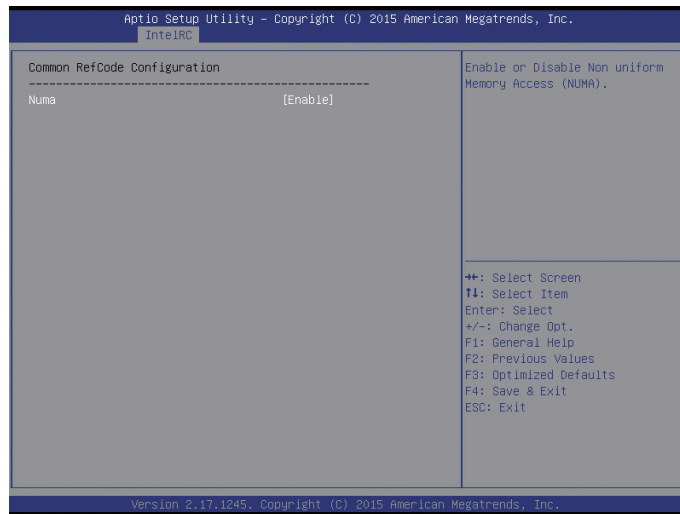


Parameter description of Energy Perf BIAS interface:

Parameters	Function description
Energy Performance Tuning	Energy performance tuning setting, option parameters: BIOS/OS.
Energy Performance BIAS	Energy performance BIAS setting, option parameters: Performance/Balanced Performance/Balanced Power/Power
Power/Performance Switch	On-off setting of auto switch between Power/Performance mode
Workload Configuration	Optimize the workload characteristic, Balanced option is suggested.

### 3.2.3.3 Common RefCode Configuration

Common RefCode Configuration interface is used to set the general options.

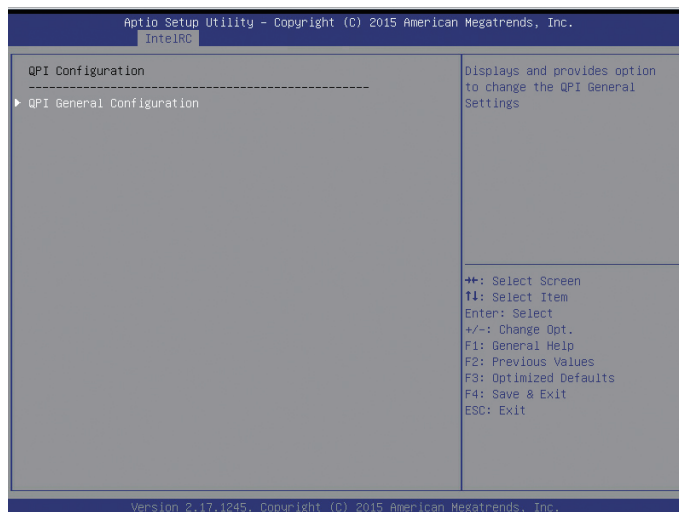


Parameter description of Common RefCode Configuration interface:

Parameters	Function description
Numa	Numa on-off setting

### 3.2.3.4 QPI Configuration

QPI Configuration interface is used to set the options related with QPI.

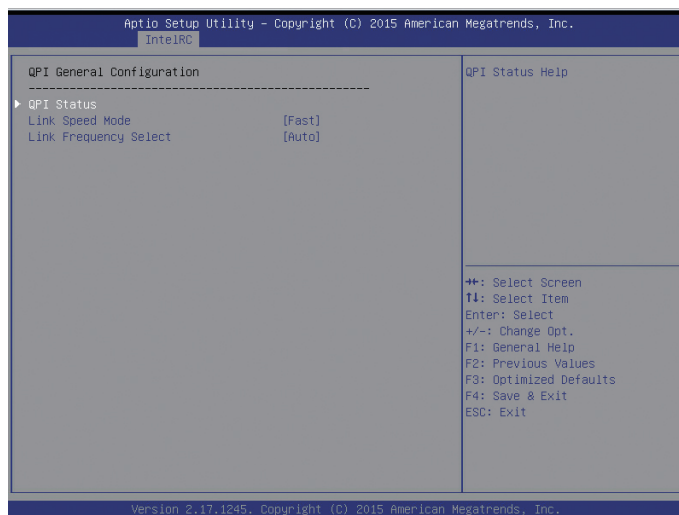


Parameter description of QPI Configuration interface:

Parameters	Function description
QPI General Configuration	QPI parameter setting submenu

### QPI General Configuration

QPI General Configuration interface is used to set the options related with QPI.

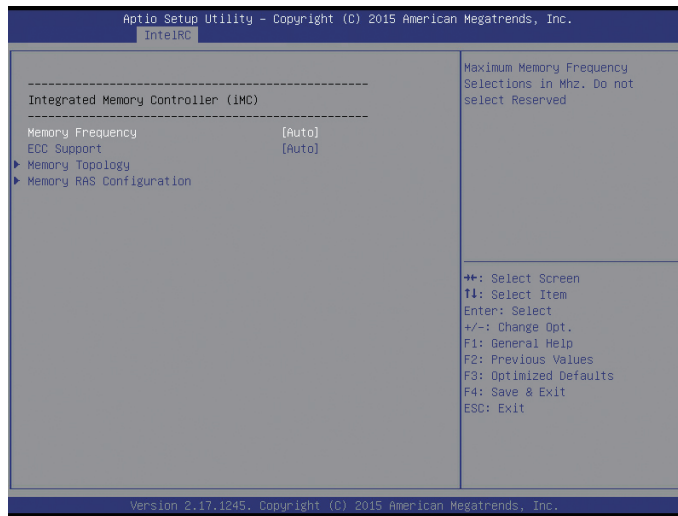


Parameter description of QPI General Configuration interface:

Parameters	Function description
QPI Status	QPI status submenu, display the current QPI link status
Link Speed Mode	Link speed mode setting, option parameters: Fast/Slow
Link Frequency Select	Link frequency setting, option parameters: Auto/(5.6 GT/s)/(6.4 GT/s)/(7.2 GT/s)/(8.0 GT/s)/(8.8 GT/s)/(9.6 GT/s)

### 3.2.3.5 Memory Configuration

Memory Configuration interface is used to set the options related with memory.

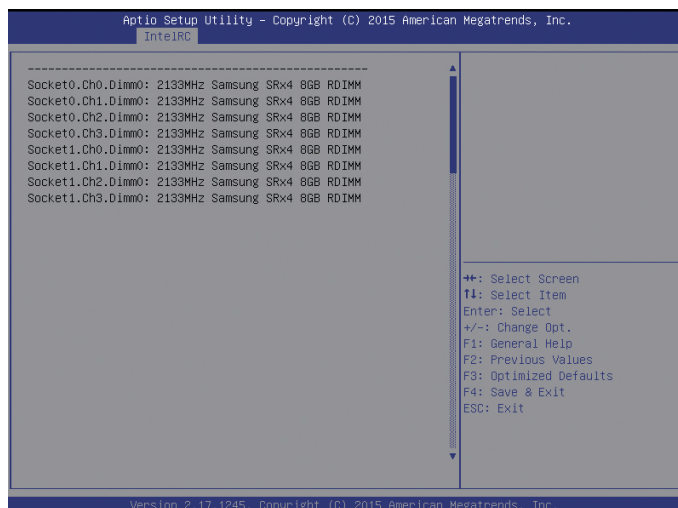


Parameter description of Memory Configuration interface:

Parameters	Function description
Memory Frequency	Memory frequency setting
ECC Support	ECC support setting
Memory Topology	Memory topology submenu
Memory RAS Configuration	Memory RAS configuration submenu

### Memory Topology

Memory Topology interface mainly displays the detailed mainboard information.

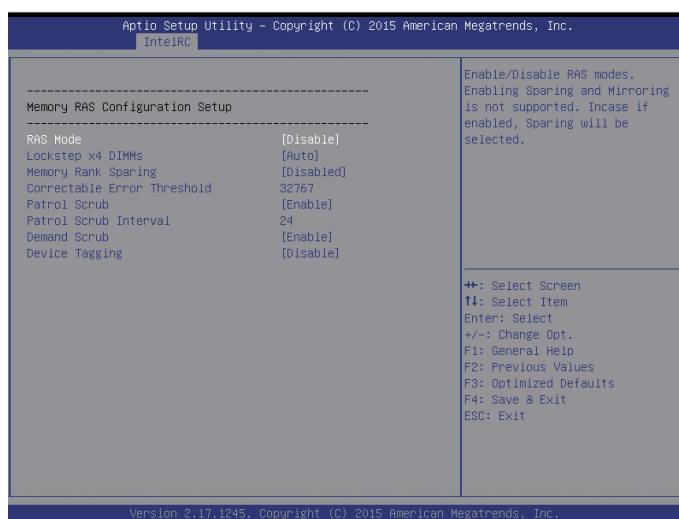


Parameter description of Memory Topology interface:

Parameters	Function description
Socket0.Ch0.Dimm0: 2133MHz Samsung SRx4 8GB RDIMM	Memory location information, frequency, manufacturer, Rank amount, capacity, etc.

### Memory RAS Configuration

Memory RAS Configuration interface is used to set the options related with memory RAS features.



Parameter description of Memory RAS Configuration interface:

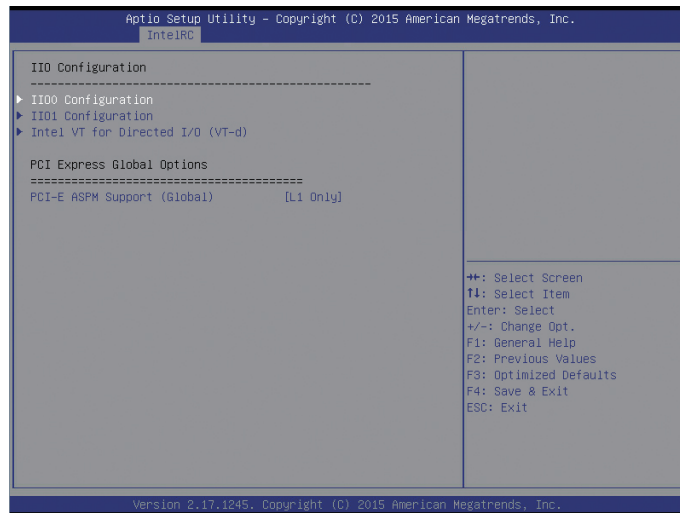
Parameters	Function description
Memory Mode	Memory mode setting, option parameters: Independent/Mirroring/LockStep. Independent mode: memories are independent of each other; Mirroring mode: the memory capacity reduces by half; LockStep mode: multiple memory channels synchronize precisely, processing the same instruction at the same time; the total memory capacity will not change.
Lockstep X4 DIMMs	Lockstep on-off setting of X4 DIMMs
Memory Rank Sparing	On-off setting of memory Rank sparing When it is set to Enabled, users can select the memory sparing mode. It is a kind of memory channel sparing in Rank, the total memory capacity varies with sparing modes, and it supports at most half of the memory capacity to be used for sparing.
Correctable Error Threshold	Correctable error threshold setting



Patrol Scrub	On-off setting of patrol scrub
Patrol Scrub Interval	Patrol scrub interval setting, unit is hour, in range of 0~24.
Demand Scrub	Demand scrub setting
Device Tagging	On-off setting of device tagging If this option is enabled, when the correctable errors exceeds the threshold, ECC chips will replace the disabled data chips, which will lead to the memory loses ECC 1bit correcting function, and can only check errors.

### 3.2.3.6 IIO Configuration

IIO Configuration interface is used to configure PCIe slots.



Parameter description of IIO Configuration interface:

Parameters	Function description
IIO0 Configuration	IIO0 configuration submenu, used to set the Link speed of devices on PCIE of CPU0 and on-off of PCI-E ASPM support
IIO1 Configuration	IIO1 configuration submenu, used to set the Link speed of devices on PCIE of CPU1 and on-off of PCI-E ASPM support
Intel VT for Directed I/O (VT-d)	On-off setting of Intel VT-d
PCI-E ASPM Support	PCIe power management mode, option parameters: Disable/L1 Only

### 3.2.3.7 PCH Configuration

PCH Configuration interface is used to configure PCH, including PCH devices configuration, PCH SATA configuration, USB configuration, etc.



Parameter description of PCH Configuration interface:

Parameters	Function description
PCH Devices	PCH devices configuration submenu
PCH SATA Configuration	PCH SATA configuration submenu
USB Configuration	USB configuration submenu

### PCH Devices

PCH Devices interface is used to set the options related with PCH devices.

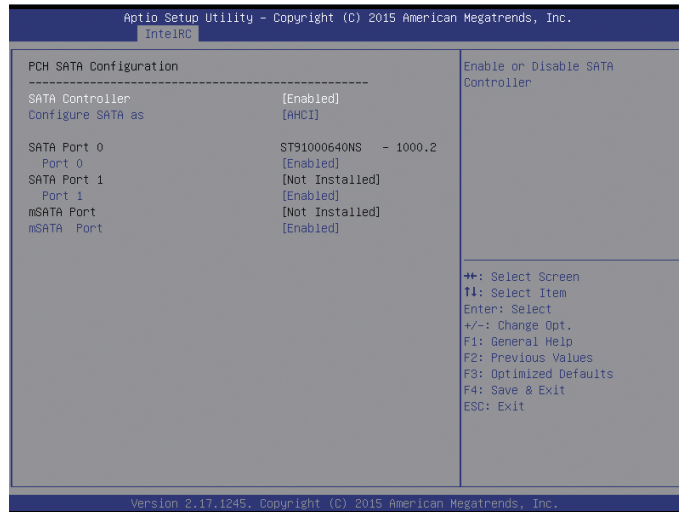


Parameter description of PCH Devices interface:

Parameters	Function description
PCH state after G3	AC power state setting: Power OFF/ Last State/ Power ON

## PCH SATA Configuration

PCH SATA Configuration interface is used to configure the onboard SATA ports.

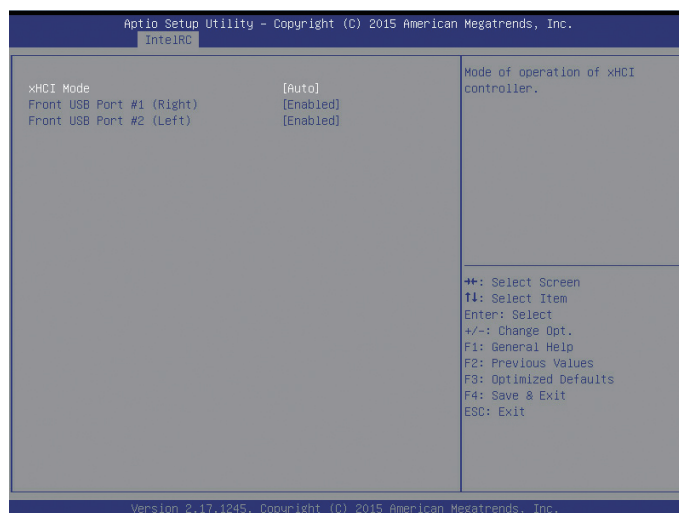


Parameter description of PCH SATA Configuration interface:

Parameters	Function description
SATA Controller	On-off setting of SATA controller
Configure SATA as	Set SATA mode, option parameters: AHCI/RAID
SATA Port 0/1/2/3	Information of hard drives connected to SATA port 0/1/2/3

### 3.2.3.8 USB Configuration

USB Configuration interface is used to configure the onboard USB ports.

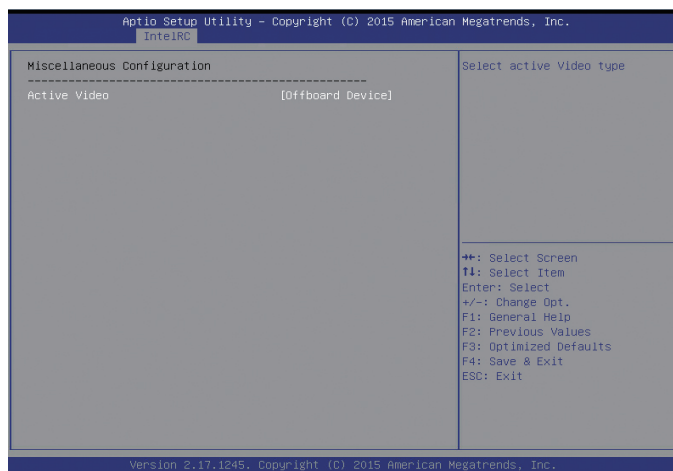


Parameter description of USB Configuration interface:

Parameters	Function description
xHCI Mode	On-off setting of XHCI controller, support USB3.0 if enabled
Front USB Port #1 (Right)	On-off setting of USB port on the right of the front panel
Front USB Port #2 (Left)	On-off setting of USB port on the left of the front panel

### 3.2.3.9 Miscellaneous Configuration

Miscellaneous Configuration interface is used to set other options.

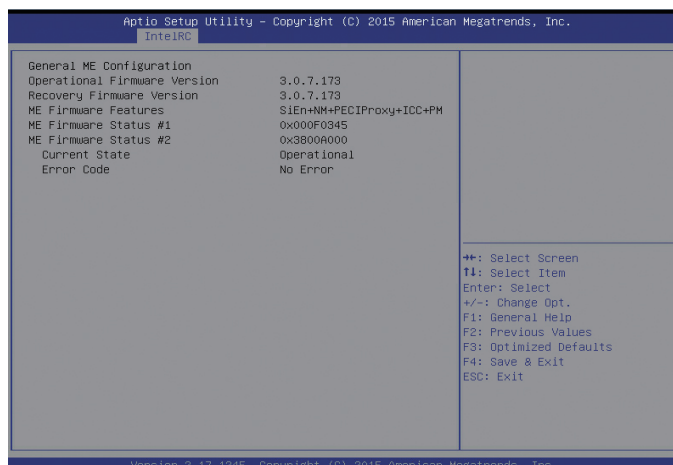


Parameter description of Miscellaneous Configuration interface:

Parameters	Function description
Active Video	Priority setting of onboard/offboard graphics

### 3.2.3.10 Server ME Configuration

Server ME Configuration is used to display the server ME information and set the relevant options.

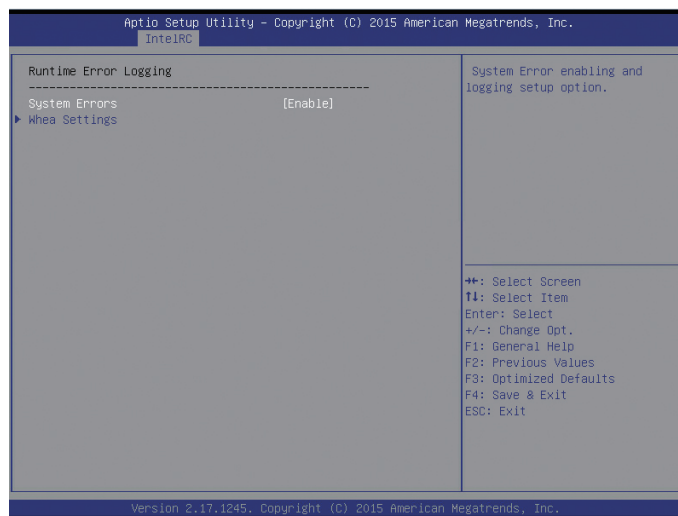


Parameter description of Server ME Configuration interface:

Parameters	Function description
Operational Firmware Version	ME Operational firmware version
Recovery Firmware Version	ME recovery firmware version
ME Firmware Features	ME firmware features
ME Firmware Status #1	ME FW status #1
ME Firmware Status #2	ME FW status#2
Current State	Current state
Error Code	Error code

### 3.2.3.11 Runtime Error Logging

Runtime Error Logging interface is used to configure server RAS.

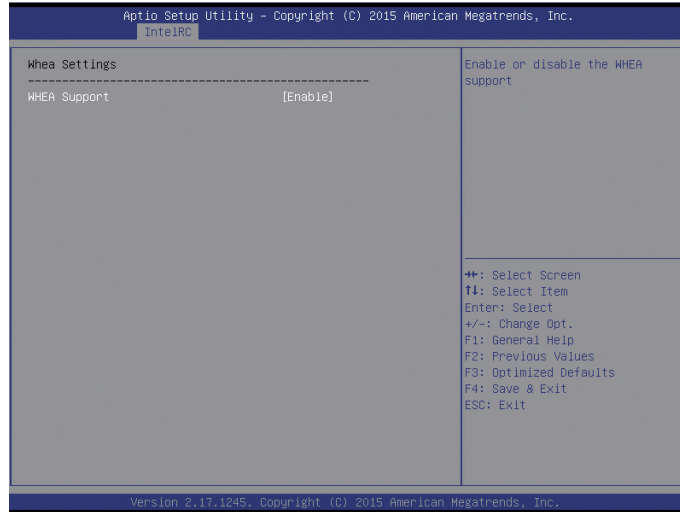


Parameter description of Runtime Error Logging interface:

Parameters	Function description
System Errors	On-off setting of system errors
WHEA Settings	WHEA settings submenu

### Whea Settings

Whea Settings interface is used to set the options related with WHEA.

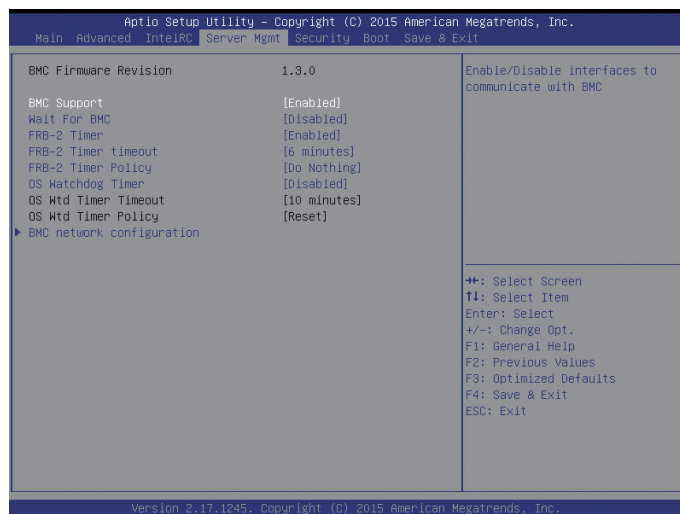


Parameter description of Whea Settings interface:

Parameters	Function description
WHEA Support	WHEA on-off setting

### 3.2.4 Sever Mgmt

Server Mgmt interface is used to set the options related with server management, including watchdog, BMC network setting, BMC user setting, system health information, etc.

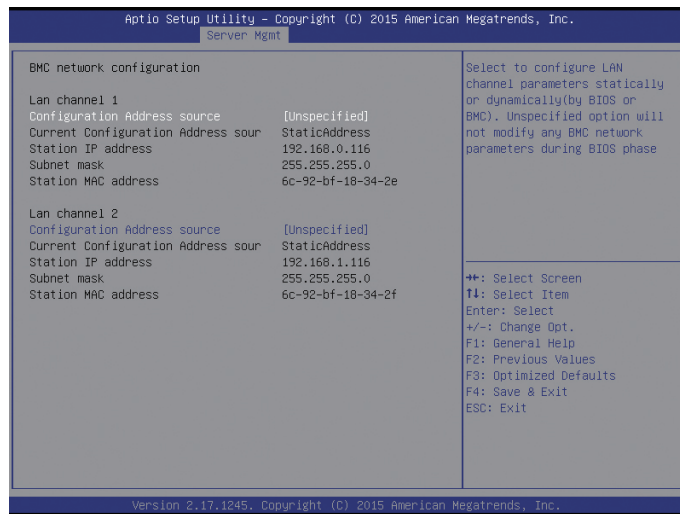


Parameter description of Server Mgmt interface:

Parameters	Function description
BMC Firmware Version	BMC firmware version of the current mainboard
BMC Support	On-off setting of BMC support
Wait For BMC	On-off setting of wait for BMC before BIOS startup
FRB-2 Timer	On-off setting of FRB-2 timer
FRB-2 Timer Timeout	FRB-2 timer timeout setting
FRB-2 Timer Policy	FRB-2 timer policy setting
OS Watchdog Timer	On-off setting of OS watchdog timer
OS Wtd Timer Timeout	OS Wtd timer timeout setting
OS Wtd Timer Policy	OS Wtd timer policy setting
BMC Network Configuration	BMC network configuration submenu

### 3.2.4.1 BMC Network Configuration

BMC network configuration interface is used to configure BMC network through BIOS.

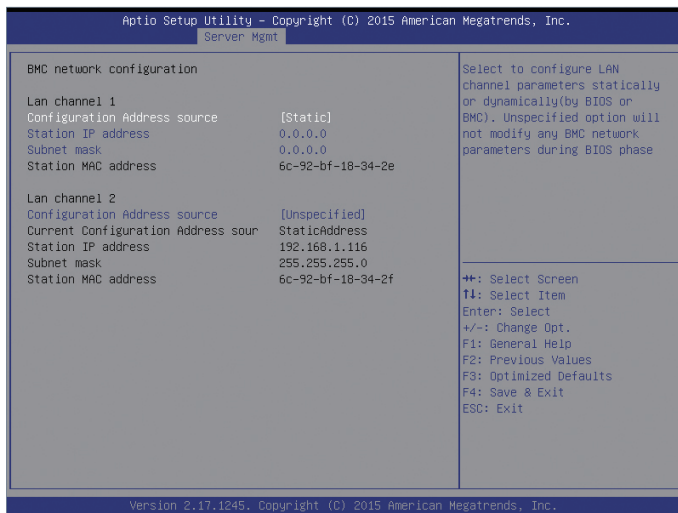


Parameter description of BMC network configuration interface:

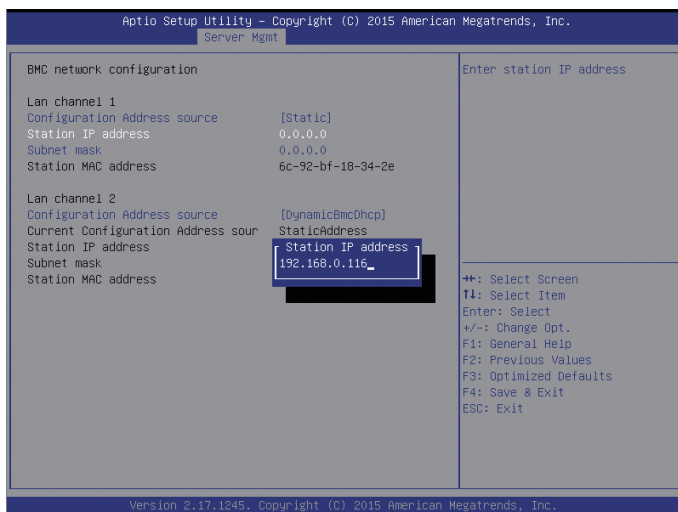
Parameters	Function description
Configuration Address Source	Configure BMC network state parameters: Unspecified: BMC network parameter will not be changed Static: static BMC network parameter setting DynamicBmcDhcp: dynamically obtain BMC network parameter
Current Configuration Address	Current BMC configuration address state
Station IP address	Station IP address
Subnet mask	Subnet mask
Station MAC address	Station MAC address

### Set BMC static network parameter

1) Set the option of Configuration Address source to **【Static】** , and the BMC network will be set to static at once, as shown in the following figure:



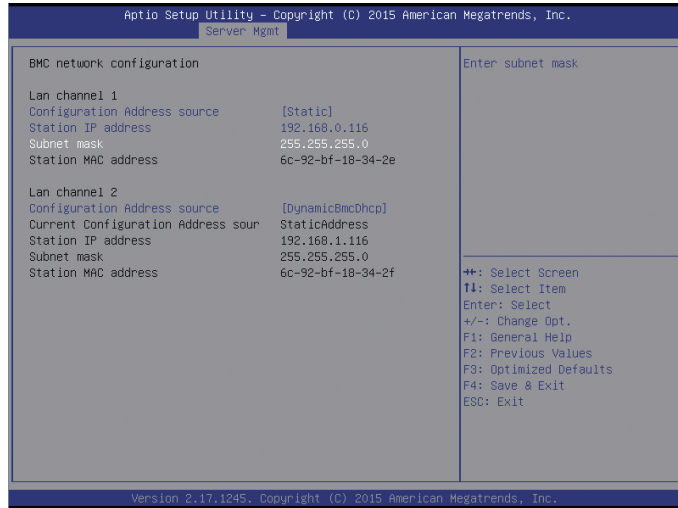
2) Select the option of Station IP address, press Enter, manually input the Static IP in the pop-up window, and press Enter to confirm;



If the entered IP is invalid, there will be a prompt of “Invalid Station IP Entered!!!”, and assign the IP address as 0.0.0.0; here the assignment just changes the IP address in BIOS setup interface, won't trigger IPMI command to change BMC IP.

Subnet mask setting is similar to Station IP address setting, and will not be explained here. After setting, BMC network parameters will take effect, as shown in the following figure, users can login BMC Web interface to operate.



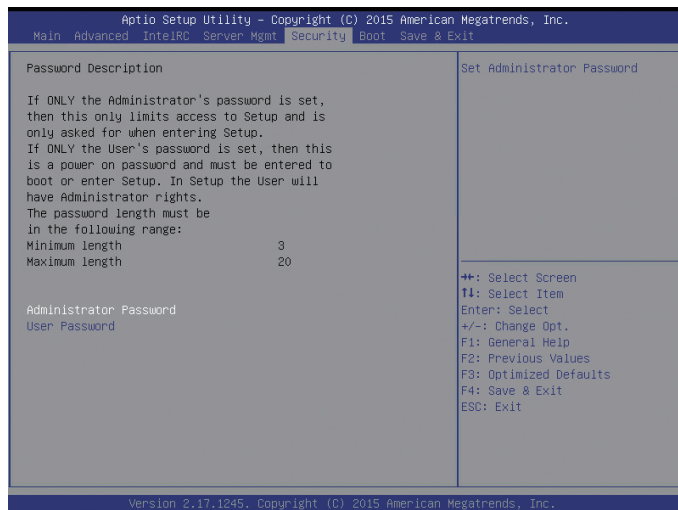


### Set BMC dynamic network parameter

Set the option of Configuration Address source to **【DynamicBmcDhcp】** and save it; after reset, users can see the BMC IP address.

### 3.2.5 Security

Security interface is used to set administrator and user's password.

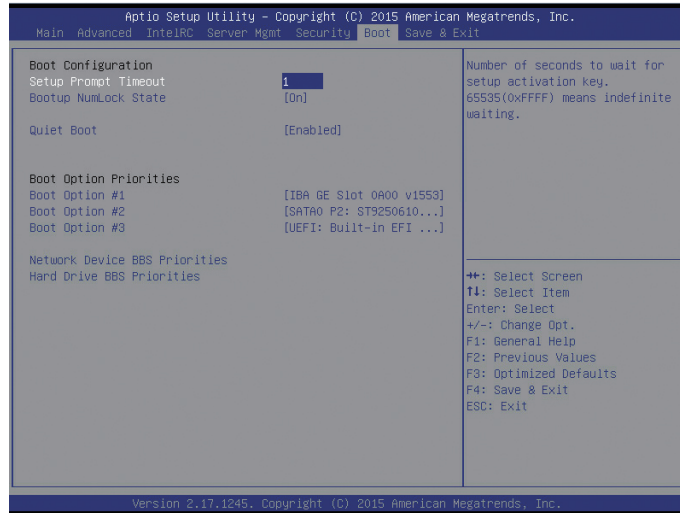


Parameter description of Security interface:

Parameters	Function description
Administrator Password	Create administrator password
User Password	Create user password

### 3.2.6 Boot

Boot interface is used to set boot options, including boot mode, boot priority and boot process.

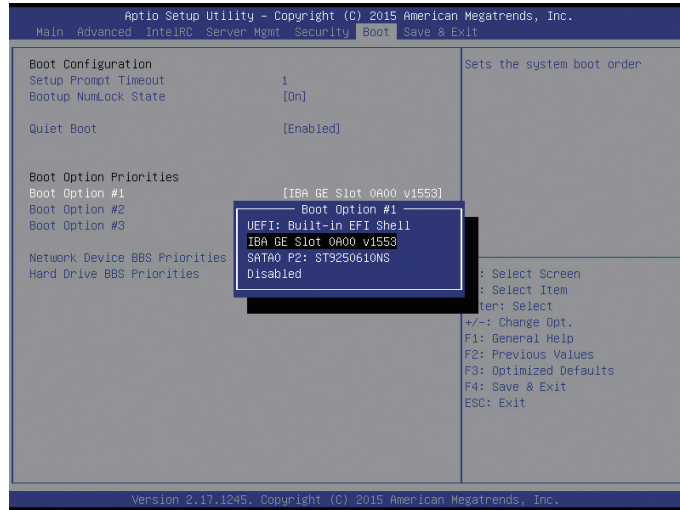


Parameter description of Boot interface:

Parameters	Function description
Setup Prompt Timeout	Time setting of waiting for activation code before entering BIOS Setup
Bootup NumLock State	NumLock state setting during bootup
Quiet Boot	On-off setting of quiet boot mode: Enabled: it will display the Logo set by manufacturer; Disabled: the boot screen is POST interface
Boot Option Priorities Boot Option #X	Boot option priorities setting
Network Device BBS Priorities	Network device BBS priorities setting
USB Driver BBS Priorities	USB driver BBS priorities setting
Hard Driver BBS Priorities	Hard driver BBS priorities setting

#### How to set BIOS Boot:

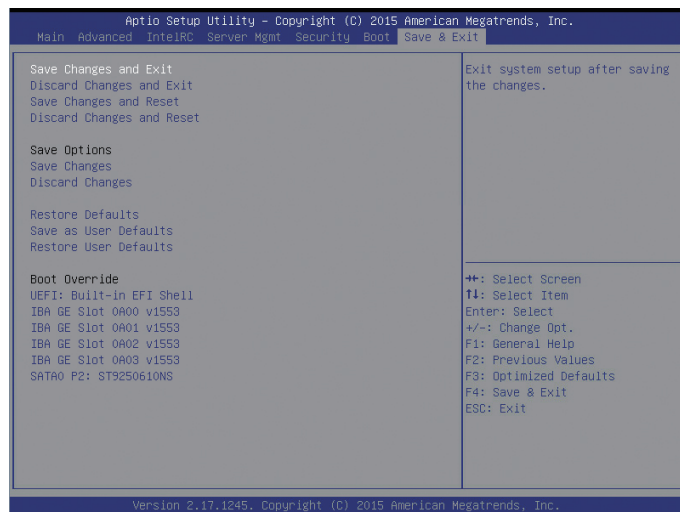
Enter Boot operation interface, move the cursor to Boot option #X through up & down key, set the system boot priority, and X can be 1, 2, 3, etc.



Take Boot option #1 as an example, set the first boot device: move the cursor to Boot option #1, press enter, the options will pop up: UEFI:Built-in EFI Shell, IBA GE slot 0400 v1553, SATA0 P2: ST9250610NS, etc., select one through the up & down key, such as, IBA GE slot 0400 v1553, press Enter, and the selected network is the first boot option.

### 3.2.7 Save & Exit

Save & Exit interface is used to save parameter changes and exit BIOS setup, as shown below:



Parameter description of Save & Exit interface:

Parameters	Function description
Save Changes and Exit	Save changes and exit
Discard Changes and Exit	Discard changes and exit
Save Changes and Reset	Save changes and reset
Discard Changes and Reset	Discard changes and reset
Save Changes	Save changes
Discard Changes	Discard changes
Restore Defaults	Restore defaults
Save as user Defaults	Save as user defaults
Restore user Defaults	Restore user defaults
Boot Override	Boot override, you can select from the following boot options

## 3.3 Firmware Update

Users can update BIOS under DOS or under OS.

### 3.3.1 Update BIOS under DOS

System boots from USB DOS boot disk; enter the directory where afudos tool resides, and confirm the bin file of the new BIOS version has been put into this folder.

When ME part has no change, just update BIOS part, execute the command: afudos BIOS.bin /b /p /n /x /k /l

When ME part has changes, it needs to update BIOS and ME at the same time, execute the command: afudos BIOS.bin /b /p /n /x /k /l /me

As shown in the following figure:

```

C:\AFUDOS>afudos BIOS.bin /b /p /n /x /k /l
-----
          AMI Firmware Update Utility  v5.06.01
          Copyright (C)2014 American Megatrends Inc. All Rights Reserved.
-----
Reading flash ..... done
- ME Data Size checking . ok
Secure Flash enabled, recalculate ROM size with signature...
- FFS checksums ..... ok
Loading capsule to secure memory buffer ... done
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... done
Updating Main Block ..... done
Verifying Main Block ..... done
Erasing NURAM Block ..... done
Updating NURAM Block ..... done
Verifying NURAM Block ..... done
Erasing NCB Block ..... done
Updating NCB Block ..... done
Verifying NCB Block ..... done
Erasing RomHole Block ..... done
Updating RomHole Block ..... done
Verifying RomHole Block ..... done

```

**Note:**

After updating the BIOS, users need to power off the system first, and then power it on to start it. After disconnecting the power, please make sure there is no residual electricity on the mainboard, and then power on the server. Users can check it through testing whether UID indicator can be lit up; press UID button, if the UID indicator comes on, it indicates there is residual electricity on the mainboard, if not, there is no residual electricity on the mainboard.

Parameter description:

/b -- Program Boot Block  
/p -- Program Main BIOS  
/n -- Program NVRAM  
/x -- Don't Check ROM ID  
/k -- Program all non-critical blocks and ROM Holes.  
/l -- Program all ROM Holes  
/me -- Program ME Entire Firmware Block

### 3.3.2 Update BIOS under Linux System

It needs to use afulnx tool to update BIOS under Linux OS, and afulnx tool has two versions of 32-bit and 64-bit. Taking Linux 64bit OS as an example, use afulnx\_64 tool, enter the directory where afulnx\_64 tool resides, and put the bin file of the corresponding BIOS into this folder.

When ME part has no change, just update BIOS part, execute the command: `./afulnx_64 BIOS.bin /b /p /n /x /k /l`

When ME part has changes, it needs to update BIOS and ME at the same time, execute the command: `./afulnx_64 BIOS.bin /b /p /n /x /k /l /me`, BIOS.bin is the bin file of the new BIOS version.

The notes after update and parameter description are the same as those under DOS.

Besides, when updating BIOS under Linux system, it needs to run the afulnx\_64 tool under root, and the afulnx\_64 tool needs driver's support; the system should be installed with gcc package, otherwise, the driver can't be built.

## 4 RAID System

This chapter mainly introduces the configuration and usage of SAS RAID and onboard SATA RAID. To use RAID, it needs to enter BIOS, and set IntelRCSetup→PCH Configuration→PCH SATA Configuration→Configure SATA as to **【RAID】**, save it and exit BIOS.

### 4.1 How to Enter RAID Configuration Interface

- The following prompt will appear on the screen during system booting:  
SAS Raid: Press<CTRL><A> for PMC SAS/SATA Configuration Utility  
SATA Raid: Press<CTRL-H> to enter Configuration Utility
- Press **【Ctrl】 【A】** to enter SAS RAID configuration interface, press **【Ctrl】 【H】** to enter SATA RAID configuration interface.

SAS RAID configuration interface:



SATA RAID configuration interface:

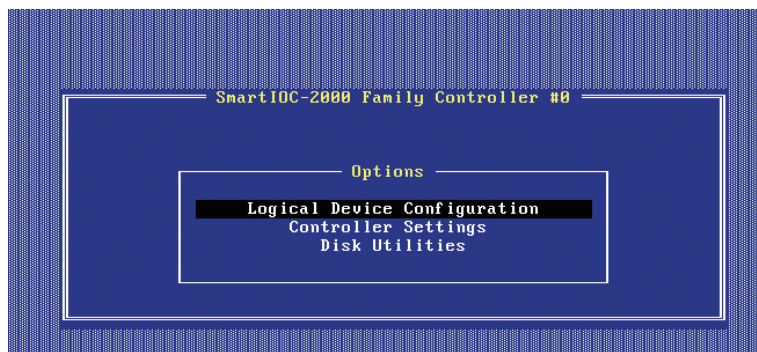


## 4.2 Control Keys

Key	Function
↑↓	Used to move the cursor among different menus or change the option value
Enter	Select the menu
Esc	Exit the menu or return to the previous menu

## 4.3 SAS RAID Settings

Enter SAS RAID configuration interface, the menu list will be displayed, as shown in the following figure.



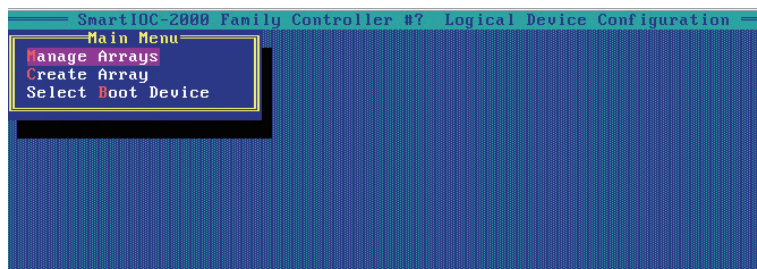
There are three executable menus in this SAS RAID configuration interface:

- Logical Device Configuration
- Controller Settings
- Disk Utilities

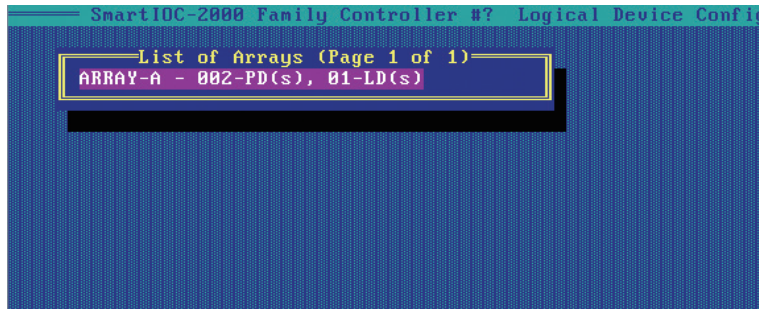
### 4.3.1 Logical Device Configuration

There are three executable menus in this configuration interface:

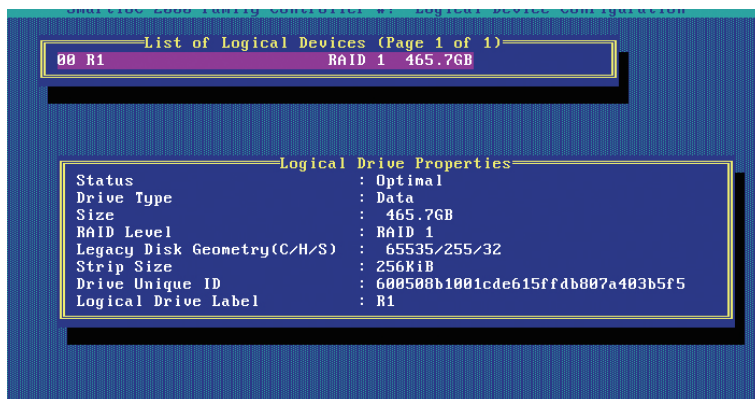
- Manage Arrays
- Create Array
- Select Boot Device



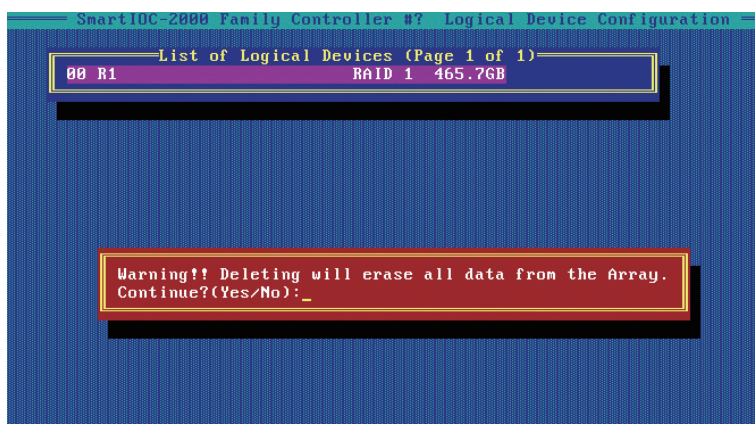
Select **【Manage Arrays】** and press Enter, the created RAID will be displayed.



Press Enter again; the detailed information of RAID will be displayed, as shown below:



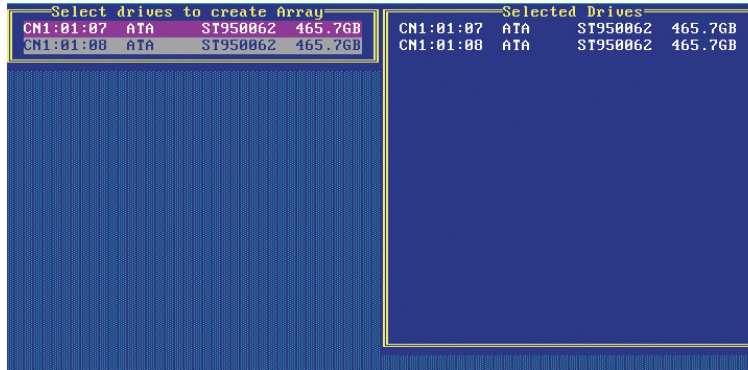
Press Esc, return to the previous interface; press Delete, it will prompt whether to delete RAID, select Yes or No.



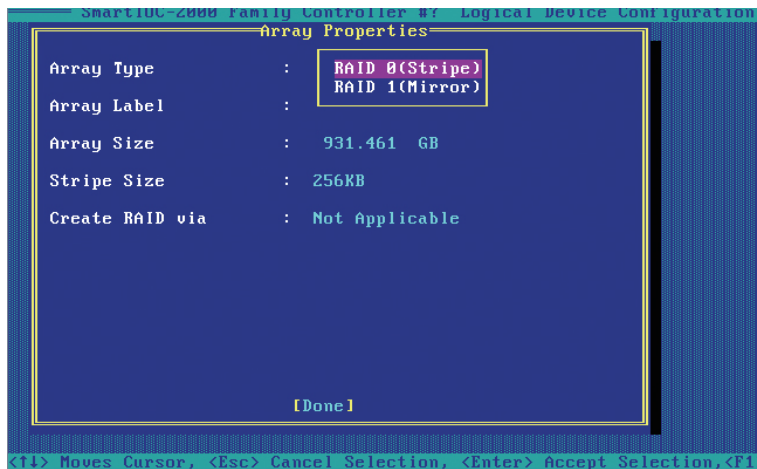
#### 4.3.1.1 Create Array

This option is used to create RAID, and the interface is as shown below. Use space key to select; after selection, press Enter to enter RAID setting interface.





The RAID setting interface is as shown below; after selection, press Enter to set the next item. After all settings finished, move the cursor to **【Done】** option and press Enter to finish the RAID creation.



Array Type: Select RAID array type, including two options of RAID0 (Stripe) and RAID1 (Mirror), please select according to the actual needs.

RAID0: allow 2 or more hard disks to make this RAID.

RAID1: allow 2 hard disks to make this RAID.

Array Size: Set the array size, it defaults to the maximum size.

Stripe Size: Select the stripe size.

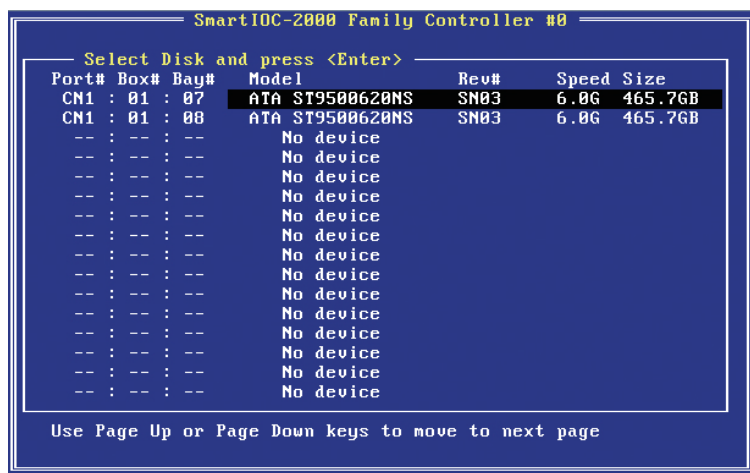
After finishing the above settings, please select **【Done】** and press Enter. System will prompt “WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST. Are you sure you want to create this volume?(Y/N):” If you want to create the RAID volume, please input Y, and all of the data in selected hard disks will be lost. If you don’t want to create the RAID

volume, please input N and exit the volume creation.

Here, we input Y to create the RAID volume.

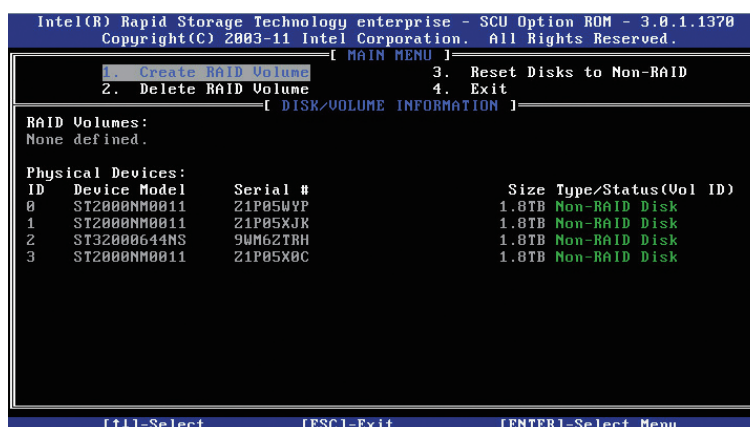
### 4.3.2 Disk Utilities

Select **【Disk Utilities】** , the related information of hard disks will be displayed.



## 4.4 SATA RAID Settings

Enter SATA RAID configuration interface, it will display the menu list, the information (disk ID, disk type, disk size and whether it's a RAID member or not) of hard disks connected to SATA controller, and the information (volume ID, name, RAID level, size, status, and whether it's bootable or not) of existed RAID volumes, as shown below:



There are four executable menus in this SATA RAID configuration interface:

- Create RAID Volume: create RAID volume.
- Delete RAID Volume: delete the existed RAID volume.

- Reset Disks to Non-RAID: reset the hard disks in RAID volume and revert to non-RAID status.
- Exit: exit SATA HostRAID configuration interface.

#### 4.4.1 Create RAID Volume Menu

After entering SATA RAID configuration interface, select this menu through up & down keys, and then press Enter to enter create RAID volume menu, or directly input the number in front of the menu to enter it.

System will display the following menu options:

Name: please input the volume name.

RAID Level: please select RAID level, if there is no RAID created, there are two options of RAID0 (Stripe) and RAID1 (Mirror), please select according to the actual needs.

RAID0: allow 2 or more hard disks to make this RAID.

RAID1: allow 2 hard disks to make this RAID.

Disks: select hard disks to make this RAID volume. Select this option and press Enter, it will enter hard disk selection interface. Please use space key to select the hard disks to make this RAID volume, and then press Enter to return to create RAID volume menu interface.

Strip Size: please select the strip size, only RAID0 and RAID5 volume can select this option.

Capacity: set the volume's capacity, it defaults to the maximum capacity.

After finishing the above settings, please select **【Create Volume】**, and press Enter, system prompts "WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST. Are you sure you want to create this volume?(Y/N):".

If you want to create the RAID volume, please input Y, and all of the data in selected hard disks will be lost. If you don't want to create the RAID volume, please input N and exit the volume creation.

Here, we input Y to create the RAID volume. After creation, return to SATA HostRAID configuration interface, and the created RAID volumes will be displayed in the RAID volume list.

#### 4.4.2 Delete RAID Volume Menu

After entering SATA RAID configuration interface, select this menu through up & down

keys, and then press Enter to enter delete RAID volume menu, or directly input the number in front of the menu to enter it.

System prompts “Deleting a volume will reset the disks to non-RAID. Warning: ALL DISKS DATA WILL BE DELETED.”.

If you are sure to delete this RAID volume, please press **【DEL】**, system will pop up a prompt again: “ALL DATA IN THE VOLUME WILL BE LOST! Are you sure you want to delete “Volume\*”? (Y/N):”, if you are sure to delete this RAID volume, please input Y, and if you want to cancel the delete operation, please input N.

#### 4.4.3 Reset Disks to Non-RAID Menu

After entering SATA RAID configuration interface, select this menu through up & down keys, and then press Enter to enter this menu, or directly input the number in front of the menu to enter it.

System will display all hard disks in the RAID volume, please use the space key to select hard disks to be reset according to the actual needs, and then press Enter, system will prompt again that whether it needs to reset disks, follow the prompt to input Y or N. Please note that all of the data in the hard disk will be lost after reset, and this hard disk will not belong to RAID volume.

#### 4.4.4 Exit Menu

After entering SATA RAID configuration interface, select this menu through up & down keys, and then press Enter to enter this menu.




System prompts “Are you sure you want to exit?(Y/N):”, input Y, it will exit SATA RAID configuration interface, input N, the exit operation will be canceled.

## 5 Hardware Maintenance

### 5.1 Tool Preparation

- Necessary tools are shown in the following table.

Tool List

Illustration	Name	Description
	Phillips Screwdriver	Used to fix screws.
	Anti-static Wrist Strap	Used to contact or operate devices and apparatus, to prevent electrostatic discharge.
	Anti-static Gloves	Used to plug in the single board, hand-held single board or other precision instruments, to prevent electrostatic discharge.

### 5.2 Parts Replacement

Special tips: Except hot-swappable parts (i.e. hot-swappable disk drives), all part replacements could only be carried out with power disconnected.

#### 5.2.1 CPU Replacement

During installing and replacing the CPU, please pay attention to the following issues:

- If installing two CPUs, type of these two CPUs shall be the same.
- If only one CPU is to be installed, please operate according to the following requirements:
  - 1) This CPU has to be installed on CPU0's socket.
  - 2) It is not allowed to dismantle the protective cover on socket1 without CPU1 installed.

Step 1: Lift the two socket clips to open the load plate.

Step 2: Insert the CPU into the CPU socket, and remove the CPU socket cover.

Step 3: Lower the CPU load plate, and then secure it with the two socket clips.



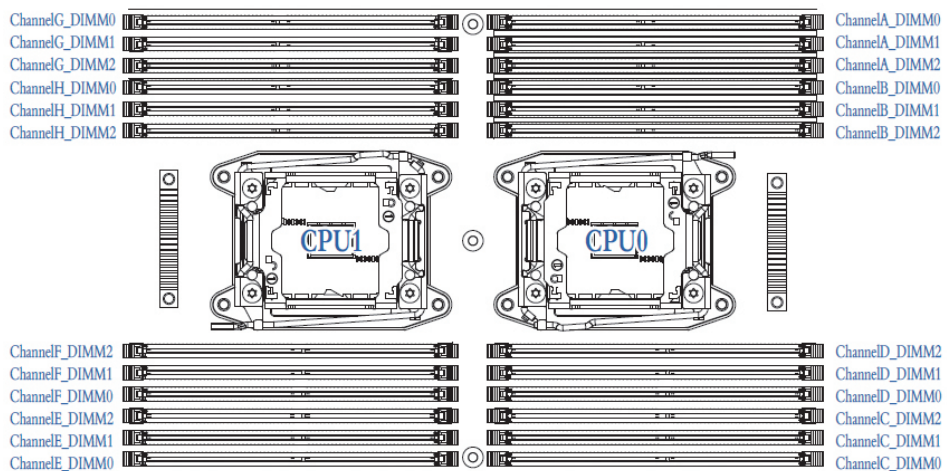
Step 4: Fix the CPU heatsink on top of CPU, and tighten the screws on the heatsink.

#### Notes:

- It is required to coat thermal grease evenly onto the contact position between CPU heatsink and CPU.
- The direction of CPU heatsink fins should be identical with the system inlet/outlet direction.
- When securing the CPU heatsink, it is required to tighten two diagonal screws first, and then tighten the other two screws.

## 5.2.2 Memory Replacement

- Memory slot layout is as shown in the following figure:



- Memory installation principle:

Only memory of the same type could be used in the same machine. Detailed memory installation and combination principles are as follows:

- a. The white slot shall take the priority, while CPU1 memory shall be symmetrically installed with CPU0 memory.
- b. For single CPU, memory shall follow the screen printed sequence: ChannelA\_DIMM0, ChannelB\_DIMM0, ChannelC\_DIMM0, ChannelD\_DIMM0, ChannelA\_DIMM1...
- c. For dual CPUs, CPU0 memory shall follow the screen printed sequence: ChannelA\_DIMM0, ChannelB\_DIMM0, ChannelC\_DIMM0, ChannelD\_DIMM0...; CPU1 memory shall be symmetrically installed with CPU0 memory: ChannelE\_0, ChannelF\_0, ChannelG\_0, ChannelH\_0...

Step 1: Open the lock tabs on both ends of memory slot.

Step 2: Align the bottom key with the receptive point on the slot, press both ends of the memory with your thumbs, to insert the memory into the slot completely, and the lock tabs will automatically secure the memory, locking it into place.

### 5.2.3 Hard Drive Replacement

Step 1: Press the hard drive panel button.

Step 2: The lever on hard disk tray pops up automatically, pull the hard disk tray outwards to remove it.

Step 3: Use four screws to fix the hard drive into the tray.

Step 4: Install the hard drive into the chassis, and lock the hard drive lever firmly.

### 5.2.4 Air Duct Replacement

Step 1: Open the upper cover of the chassis.

Step 2: Press the buckles on both ends of the air duct inwards, and then vertically remove the air duct upwards.

### 5.2.5 Mainboard Replacement

Step 1: Dismantle all parts and cables connected to mainboard.

Step 2: Lift spring fixed legs on mainboard, then move the mainboard forward to remove the hardy hole, and vertically remove the mainboard upwards.

## 6 Common Faults, Diagnosis and Troubleshooting

This chapter introduces the common server faults as well as corresponding diagnosis and troubleshooting suggestions.

### 6.1 Common Faults

1) No power after startup

After the machine is connected with power cable, no power is provided for the machine while pressing the On/Off button; the indicator does not light up after power on.

2) Power module indicator off or red indicator on

The machine is under normal operation, but a certain power module indicator is off or red indicator is on.

3) No display after power on

No information appeared on the display after power on via pressing On/Off button.

4) Front panel indicator is off

All front panel indicators are off after power on.

5) Front panel status indicator alarms

The machine is under normal operation, but status indicator gives an alarm.

6) Blank screen of the display

Blank screen occurs during using the display.

7) Abnormal display

Image dithering, rolling or warping occurs during using the display.

8) Abnormal display of memory capacity

The operating system shows that memory capacity is inconsistent with physical memory capacity.

9) Keyboard and mouse are not available

Neither keyboard nor mouse could be operated normally.

10) USB interface problem

Introduce solutions when failing to use USB interface.



## 6.2 Diagnosis and Troubleshooting Instructions

### 1) Diagnosis and troubleshooting on power-on failure at startup

Description: After pressing the power button, server front control panel indicator (power-on status indicator, hard drive status indicator) is off, meanwhile, no KVM (display) output is displayed, and server chassis fan does not rotate.

#### Operation steps:

- a、 Verify whether power supply is normal or not: if power module indicator is on, it indicates normal power supply; if power module indicator is off, please check if power supply is normal;
- b、 If power supply is normal, plug in and off the power module again to test, and then power on for verification;
- c、 If there's a machine and a power module of the same type, you could change the power module to test whether there's a power module fault;
- d、 If above operations could not solve the problem, please contact Inspur customer service.

### 2) Power module indicator off or red indicator on

Description: The machine is under normal operation, but a certain power module indicator is off or the red light is on.

#### Operation steps:

- a、 Firstly check whether all power cables are normal, and plug in power cables again;
- b、 If the fault still exists, plug in and off the power module again;
- c、 If shutdown is allowed, you could exchange these 2 power modules, to judge whether it is a power module fault.
- d、 If above operations could not solve the problem, please contact Inspur customer service.

### 3) No display after power on

Description: After pressing the power button, server front control panel indicator is on, but there's no output on the display.

#### Operation steps:

- a、 Firstly check whether the display is connected normally with the server's VGA

port;

- b、 Test on another display;
- c、 If above operations could not solve the problem, please contact Inspur customer service.

#### 4) Front panel status indicator alarms

Description: The server is under normal operation, but system status indicator on front control panel flashes or the red indicator is on.

##### Operation steps:

Please check whether all power module indicators are steadily green, if so, you can login BMC web interface to collect logs, and contact Inspur customer service.

#### 5) Memory capacity incomplete

Description: Memory capacity viewed via the operating system does not correspond with physical memory capacity.

##### Operation steps:

- a、 Ensure all memories of correct type have been correctly installed in place.
- b、 Enter BIOS setup to view memory capacity, if it could be completely identified in BIOS setup, this may lie in the limitation on memory capacity set by the operating system. Otherwise, please contact Inspur customer service.

#### 6) Keyboard and mouse are not available

Description: Neither keyboard nor mouse could be operated normally.

##### Operation steps:

- a、 Make sure the keyboard or mouse has been connected correctly and firmly.
- b、 Test other parts to verify whether it is a mouse or keyboard fault.
- c、 Retest the machine via power on/off.
- d、 Reboot and enter cmos or raid configuration interface to test keyboard or mouse performance, when tested in a non-system situation, if keyboard or mouse performance turns out to be normal, a system fault could be considered; if keyboard or mouse fault still exists, a mainboard interface fault could be considered, and you could call Inspur technical hotline for support.

## 7) USB interface problem

Description: Unable to use devices with a USB interface.

### Operation steps:

- a、 Make sure the operating system on server supports USB devices.
- b、 Make sure system has been installed with correct USB device driver.
- c、 Power off the server, and then power on again to test.
- d、 Check whether the USB device is normal when connecting to other hosts.
- e、 If the USB device is normal when connecting to other hosts, the server may be abnormal, please call Inspur technical hotline for support; if the USB device turns out to be abnormal when connecting to other hosts, please replace the USB device.

## 7 Services

### 7.1 How to Obtain Warranty Service

If there are any issues that are difficult to solve or can not be settled by yourself during routine maintenance or troubleshooting, please ask for technical support from Inspur.

#### 7.1.1 Preparations before Contacting Inspur

For better solutions, it is suggested to make the following preparations before asking for technical support from Inspur.

##### 7.1.1.1 Collect necessary fault information

- Client name and address
- Contact name and phone number
- Host serial number of the failure equipment
- Occurrence time of the fault
- Detailed description of the fault
- Device type and software version
- Measures taken after the fault and results
- Problem level and expected solution time

##### 7.1.1.2 Necessary debugging preparations

When turning to Inspur for technical support, Inspur technical support engineers may help you carry out some operations, to further collect fault information or make troubleshooting directly, so please collect necessary fault information before turning to technical support, and prepare tools such as screwdriver, screws, serial cable and Ethernet cable, etc. which may be useful.

### 7.2 How to Contact Inspur

#### 7.2.1 WeChat Service

We provide services such as Wechat query, self-troubleshooting, repair appointment and online consultancy etc., please pay attention.

Wechat public account: Inspur expert service

Webchat number: lc4008600011

2D code:



### 7.2.2 Enterprise Business QQ

QQ number: 4008600011

### 7.2.3 Service Email

Email address: lckf@inspur.com

In order to handle customer problems in a more efficient way, please send an email to us according to the following mail format.

<b>Company Name</b>	XX city, XX province
<b>Contact Information</b>	Name Mobile/Phone (Ext.)
<b>Machine Serial No.</b>	21xxxxxxx or 8000xxxxx
<b>Problem or Fault Description</b>	Description content
<b>Attachments</b>	Fault pictures or log files.

### 7.2.4 Website Service

Inspur official website: [www.inspur.com](http://www.inspur.com)

Technical support website: [www.4008600011.com](http://www.4008600011.com)

### 7.2.5 Hotline Service

Hotline: 4008600011

## 8 Certifications & Standards

This chapter introduces the certifications achieved by this product and standards it complies with.

- USA FCC declaration  
Introduce FCC standards abided by the product
- CE declaration of EU  
Introduce CE standards abided by the product
- China Environmental Labeling  
Introduce China environmental labeling standards abided by the product.

### 8.1 USA FCC Declaration

This chapter introduces the FCC standards abided by the product.

It is regulated in Subpart B, Part 15 of 47 CFR by Federal Communications Commission of the United States that users of this product shall pay attention to the following issues:

Annotations: This device has been tested and complies with regulations related to Class A digital devices in Part 15 of FCC rules. Main purpose of these limitations is to provide reasonable protection while operating such devices in business districts, to avoid harmful disturbance. This device may produce, use and emit RF energy; if installation or usage is carried out not according to instructions, harmful disturbance may be caused on radio communication. Operating this device in residential areas may cause harmful disturbance, in this case, the user will be responsible for all costs arisen from correcting disturbance.

If the user carries out change or correction not expressly indicated by our company, it may cause the device failing to comply with FCC Class A requirements, and exempted from its authorization to operate this device.

### 8.2 CE Declaration of EU

This chapter introduces the CE standards abided by this product.

This is a Class A product. In the residential environment, this product may cause radio disturbance, in this case, the user will be asked to adopt certain appropriate measures.

### 8.3 China Environmental Labeling

This product complies with China environmental labeling criteria.

For environmental protection and resources recycling, this product and its packaging material can be recycled. The resource recovery rate of this product is designed to be no less

than 80%, and the resource recycling and regeneration rate is no less than 70%. At the end of PLC (product life cycle), please do not mix with other wastes, you could consult the local retailer or local government sector for recycling methods and place, and also could contact our customer service for recovery processing.

**Table of Hazardous Substances' Name & Content**

Part Name	Hazardous Substances					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Chassis	×	○	○	○	○	○
Motherboard	×	○	○	○	○	○
Memory	○	○	○	○	○	○
Hard Drive	○	○	○	○	○	○
Power Supply	×	○	○	○	○	○
Power Cable	○	○	○	○	○	○
USB Flash Disk	×	○	○	○	○	○
Optical Drive	×	○	○	○	○	○
External NIC	×	○	○	○	○	○
External Memory Card	○	○	○	○	○	○
Connection Board	×	○	○	○	○	○
Data Cable	×	○	○	○	○	○
Keyboard	×	○	○	○	○	○
Mouse	×	○	○	○	○	○
CPU	×	○	○	○	○	○
Processor Heatsink	×	○	○	○	○	○
Rail	○	○	○	○	○	○
Printed Matter	○	○	○	○	○	○
CD	○	○	○	○	○	○
Packing Box	○	○	○	○	○	○
Packing Pad	○	○	○	○	○	○
Packing Plastic Bag	○	○	○	○	○	○
<p><b>Instructions:</b></p> <ol style="list-style-type: none"> <li>1. This table is compiled based on the provisions of SJ/T 11364.</li> <li>2. ○: Indicates that the content of the hazardous substance in all homogenous materials of this part is below the limitation requirement as described in GB/T 26572.</li> <li>3. ×: Indicates that the content of the hazardous substance in at least one homogenous material of this part is above the limitation requirement as described in GB/T 26572.</li> <li>4. All the above parts are possible configuration parts in product, for actual product configuration please refer to the configuration label.</li> </ol>						